THE

Croonian Lectures

ON

FUNCTIONAL DERANGEMENTS OF THE LIVER.

Delivered at the Royal College of Physicians,

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LECTURE I.—PART II.

THE quantity of bile secreted by the liver has been shown experimentally to increase suddenly after a meal, reach its maximum in about two hours, and then decline; while by abstinence it is greatly lessened. In considering the functional derangements of the liver, it is very necessary to remember that the total quantity of bile secreted in twenty-four hours by a man eating an ordinary amount of food is much larger than might be expected from that which is discharged from the bowel. The daily quantity of human bile has been usually calculated from what has been observed in dogs with artificial biliary fistulæ,* and the principal results have been as follow. According to Kölliker and Müller, a dog consuming daily about one-fifteenth of its own weight of meat secretes in twenty-four hours 36·1 parts of fluid bile in 1000 parts of its own weight. According to Dr. George Scott, a dog consuming daily about one-fourteenth of its own weight of meat secretes in twenty-four hours 21·13 parts of fluid bile in 1000 parts of its own weight. According to Bidder and Schmidt, a dog consuming daily about one-seventeenth of its own weight of meat secretes in twenty-four hours 19·19 parts of fluid bile in 1000 parts of its own weight. Making allowance for the greater relative weight of the liver in the dog than in man,† it follows from these results that the amount of fluid bile secreted in twenty-four hours by a man weighing 160 lb. and on full diet, is, according to

Kölliker and Müller	66·742 oz.
Scott	42·763 „
Bidder and Schmidt	35·476 „

Similar experiments have been made on dogs by Nasse, Platner, and Stackman; and from their data Carpenter has calculated that a man weighing 154 lb. should secrete daily about 40 oz. of bile. It may be assumed, then, from experiments on the lower animals, that the quantity of bile secreted in twenty-four hours by the human liver is about 40 oz.; and this inference is, on the whole, confirmed by what is observed in those rare cases where a biliary fistula discharging bile is produced in the human subject by the ulcerative perforation of the fundus of the gall-bladder, the cystic duct remaining patent, while the common bile-duct is closed; although in some instances the quantity of bile has been less than in health, from the patient being greatly emaciated and taking little food. One case of the nature referred to has come under my own notice, the particulars of which are worth mentioning. The patient was a lady aged forty, whom I saw in October, 1869, in consultation with Mr. Curling. Owing to an obstruction of the cystic duct by a gall-stone, the gall-bladder became inflamed and converted into a chronic abscess, which was opened externally. A fistulous opening resulted, which discharged a scanty colourless viscid fluid, and gave exit to several small gall-stones. But after four months, with a fresh attack of biliary colic and vomiting, the concretion in the cystic duct was dislodged and projected into the common bile-duct, which it obstructed, as was proved by the motions becoming white, and by bile being poured in large quantity through the fistulous opening. This state of matters continued for forty one days (the patient passing white stools, but having scarcely a trace of jaundice), when there occurred another attack of biliary colic and vomiting, during which the concretion escaped into the duodenum, and the flow of bile was restored to its proper channel. In this case the quantity of bile secreted in twenty-four hours was fully 2 pints, although the patient did not weigh more than about 130 lb., and was eating a moderate diet.* I have collected several cases† of a similar nature, in which the results more or less corresponded with that observed in my patient; but I will not occupy time in reading the details. I will merely mention that Fauconneau Dufresne, in his exhaustive memoir upon Biliary Calculi in the Human Subject, observes that from the external biliary fistula, to which they now and then give rise, enormous quantities of bile may be discharged so as to inundate the patient. He mentions one case in which the daily amount was 2 pints.‡

Although the amount of bile secreted daily must vary in different persons, and in the same person under different circumstances, being modified by the quantity and quality of the food, the activity of respiration, and other conditions, it is clear, from the facts now mentioned, that but a small proportion of what is ordinarily secreted is discharged from the bowel. Berzelius found in 1000 parts of fresh human fæces only 9 parts of a substance similar to bile, which, on the calculation that the daily fæces of a man weigh 5½ oz., would make a total of 24 gr. of dried bile in the day.§ Now, assuming that the liver secretes 40 oz. of bile in the day, containing only 5 per cent. of solid matter, which is considerably below the average proportion, the amount of dried bile secreted in one day would be 960 gr., or forty times the quantity discharged from the bowel. According to Bischoff, man discharges about 46 gr. of the (altered) biliary acids by the fæces per diem; whilst Voit's estimates give 170 gr. as the quantity daily formed by the liver; 124 gr. must therefore be otherwise disposed of.‖ Bidder and Schmidt have also found that not more than one-eighth of the sulphur of the bile is normally excreted with the fæces.¶ The bile-pigment is generally believed to be all voided by the fæces; but this is clearly not the case, if there be any truth in the view already referred to, that urinary pigment is formed from bile-pigment; while the fact familiar to all clinical observers, that the bile-pigment discharged from the bowel is greatly increased by calomel and other aperients, without any corresponding increase of secretion by the liver, also seems to show that, under ordinary circumstances, much of the bile-pigment secreted by the liver is not discharged with the fæces. It may be added that in carnivorous animals and in snakes, although bile-pigment is secreted in abundance by the liver, the quantity dis-

* On this subject, see Bidder and Schmidt, Die Verdauungssäfte und der Stoffwechsel, 1852, p. 186; Dr. G. Scott, Beale's Archives of Medicine, 1858, vol. i., p. 218; Carpenter's Human Physiology, 7th edit., p. 144.

† The weight of the liver of a dog is, from six observations of Bidder and Schmidt, as 1 to 28 of the whole body. According to Quain, the weight of the liver in man is as 1 to 36 of the whole body.

* Further details of the case will be found in the Pathological Transactions, vol. xxii., p. 152.

† Dr. J. Hertz, of Königsberg, has recently recorded the case of a female, aged twenty-eight, in whom the daily flow of bile from a biliary fistula was 18 fluid ounces. It is doubtful, however, if all the bile secreted was really discharged from the fistula; for, though the stools were of a pipe-clay colour, the fact that the flow of bile into the bowel was restored after closure of the external opening by needles (but not for six days, during which no jaundice appeared) seems to show that the obstruction of the common bile-duct was not complete. (Berliner Klin. Wochenschrift, April 7th, 1873.)

In the twenty-seventh volume of the Medico-Chirurgical Transactions, Mr. W. R. Barlow records the case of a man, aged fifty-four, in whom, in consequence of a strain, the common bile-duct became temporarily obstructed, probably by a gall-stone. The result was that in twelve days 13 pints of fluid accumulated in the gall-bladder. Dr. Owen Rees found, on analysis, that four-fifths of this fluid was pure bile, so that nearly 1 pint of bile must have been secreted in the day, although the patient was under the antiphlogistic treatment of the day (1844), and had been repeatedly bled from the arm and leeched.

In the thirty-fifth volume of the Medico-Chirurgical Transactions, the case is recorded of a female, aged sixty-four, in whom the daily discharge of bile from a fistula was only 8 oz. The fistula was the result of a large gall-stone obstructing the common bile-duct, and existed for six months, at the end of which time the woman died from exhaustion. The small quantity of bile in this case was accounted for by the circumstance of the patient being very poor and having insufficient food.

In the fourth volume of the Transactions of the College of Physicians, Dr. Saunders recorded the case of a female, aged sixty-six, who discharged a large gall-stone through the abdominal parietes. For three weeks afterwards "a very profuse discharge of bile ran perpetually from the wound," although the common bile-duct remained pervious.

Haller, in his Physiology, alludes to the case of a man with a biliary fistula, from which 4 oz. of bile escaped in six hours; but there is no mention as to whether or not the common bile-duct was closed. (Physiologia: Berne, 1764 tome vi., p. 605.)

‡ Mém. de l'Acad. Royale de Méd., 1847, tome xiii.

§ Budd, op. cit., p. 52.

‖ Carpenter's "Human Physiology," seventh edition, p. 435.

¶ Die Verdauungssäfte und der Stoffwechsel, 1852, p. 218.

charged with the fæces is even relatively less than in man.*

The question then arises as to what becomes of the bile which is not discharged from the bowel, and it is obviously one having an important bearing on the pathology of many cases of jaundice, as well as upon that of many functional derangements of the liver. The reply is to be found in the fact that a large proportion of the bile secreted by the liver is again absorbed, either by the biliary passages or by the mucous membrane of the bowel. From what is now known of the diffusibility of fluids through animal membranes, it is impossible to conceive bile long in contact with the lining membrane of the gall-bladder, bile-ducts, and intestine, without a large portion of it passing into the circulating blood. The constant secretion and reabsorption of bile is in fact merely part of that osmotic circulation constantly taking place between the fluid contents of the bowel and the blood, the existence of which is too little heeded in our pathological speculations† and in therapeutics, although attention was called to it eighteen years ago by Dr. Parkes, in the Gulstonian Lectures on Pyrexia delivered before this College. "It is now known," says Dr. Parkes,‡ "that, in varying degrees, there is a constant transit of fluid from the blood into the alimentary canal, and as rapid reabsorption. The amount thus poured out and absorbed in twenty-four hours is almost incredible, and of itself constitutes a secondary or intermediate circulation never dreamt of by Harvey. The amount of gastric juice alone passing into the stomach in a day, and then reabsorbed, amounted in the case lately examined by Grünewald§ to nearly twenty-three imperial pints. If we put it at twelve pints, we shall certainly be within the mark. The pancreas, according to Krœger, furnishes twelve pints and a half in twenty-four hours, while the salivary glands pour out at least three pints in the same time. The amount of the bile is probably over two pints. The amount given out by the intestinal mucous membrane cannot be guessed at, but must be enormous. Altogether, the amount of fluid effused into the alimentary canal in twenty-four hours amounts to much more than the whole amount of blood in the body; in other words, every portion of the blood may, and possibly does, pass several times into the alimentary canal in twenty-four hours. The effect of this continual outpouring is supposed to be to aid metamorphosis; the same substance, more or less changed, seems to be thrown out and reabsorbed, until it be adapted for the repair of tissue or become effete." How many times this cycle of movement is repeated before the bile is extruded from the system we have no means of knowing;‖ but in the course of this osmotic circulation much of the bile appears to become transformed into products which are eliminated by the lungs and kidneys, while at the same time this circulation assists in the assimilation of the nutritive materials derived from the food.

In the first place, it assists in the absorption of fat. It is a well-known clinical fact that, when the common bile-duct becomes obstructed from any cause in man, the fat throughout the body wastes. Many years ago, also, it was shown by Drs. Bright and Owen Rees that, in cases of this sort, an unusual quantity of fat may often be detected in the stools.* Bidder and Schmidt likewise found that after applying a ligature to the gall-duct of a dog the animal absorbed less fat than before, and there was also a diminution of fatty matter in the chyle in the thoracic duct; the amount absorbed was calculated from a comparison of the fat eaten with the amount passed in the fæces.† There are also grounds for thinking that the entrance of bile into the bowel facilitates the absorption of the albuminous constituents of the food. The bile neutralises the acid that passes from the stomach into the duodenum, and in doing so causes a precipitate of peptones. It is difficult to say what purpose is served by this precipitation; but some experiments of Bernard led him to the conclusion that gastric juice when mixed with pancreatic juice and bile, has a more solvent action on albuminous substances than the gastric juice alone.‡ The passage of bile into the bowel appears also to be in some way essential to the formation of glycogen by the liver. In a number of experiments recently made upon cats, Dr. Wickham Legg found that the formation of glycogen was always arrested soon after ligature of the bile-duct; in one cat, the diabetic puncture of the brain was made on the sixth day after ligature of the bile-ducts, but no sugar appeared in the urine.§

But, lastly, there can be no doubt that bile is in part excrementitious, a portion of it being discharged from the bowel, and serving to rid the system of some of the products of waste of the blood and tissues. The biliary acid salts are decomposed, and, by their decomposition, they furnish the free alkali necessary for the precipitation of peptones and the saponification of the fatty matters; they are believed also to become further split up, the taurin, glycocin, and most of the cholic acid returning to the circulation, while a portion of the cholic acid is discharged with the fæces. The cholesterin is also decomposed in the bowels, and the products of its decomposition are discharged with the fæces. According to Dr. Austin Flint, jun., the cholesterin is converted into a substance which he has discovered in the fæces and designated stercorin; it appears also to be in some way related to another ingredient of the fæces discovered by Marcet, and called excretin, although this contains sulphur. Marcet, at all events, made the observation that, in very young children, cholesterin may take the place of excretin in the stools.‖ The bile-pigment also becomes changed in its passage through the bowel, the bilirubin becoming converted into biliverdin. Lastly, the bile, in its passage through the bowel, stimulates the peristaltic action of the gut; and, in virtue of its antiseptic property, which can be demonstrated out of the body, it prevents putrefactive fermentation of the intestinal contents, and the excessive generation of gas.

From what has been stated, it follows that the functions of the liver may be summed up under three heads—viz.:

1. The formation of glycogen, which contributes to the maintenance of animal heat and to the nutrition of the blood and tissues, and the development of white blood-corpuscles.

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* Liebig states that in the carnivora the whole of the bile is reabsorbed (Budd, op. cit., p. 51). Todd and Bowman also state that in carnivorous animals "little or no bile is found in the excrements"; and "in the boa, although the liver is large and no doubt secretes bile freely, the excrements contain no trace of bile" ("Physiology," vol. ii., p. 259). Although the excrement of snakes, after feeding, does present a brownish colour, and differs from the white masses of uric acid voided at other times, Marcet, who is an authority on the subject, states that the excrement of the boa is "nearly entirely composed of urates." (Philosophical Transactions, 1854, p. 279.)

† The purging of cholera may result from a stoppage of this intestinal circulation—a diminished power of absorption, rather than an increased exhalation from the bowel. Many facts prove that in cholera the power of absorption by the bowel is greatly impaired or abolished.

‡ Medical Times and Gazette, 1855, vol. i., p. 333.

§ An account of this case, abstracted by me from Grünewald's Latin memoir, will be found in Beale's Archives of Medicine, vol. i., p. 370.—C. M.

‖ It may be thought improbable that the liver should secrete from the blood of the portal vein materials which are afterwards to be absorbed by the branches of the same vessel. But it has, perhaps, been too readily assumed from the comparatively large size of the vena portæ, that it furnishes the materials for bile. Although when one vessel is diseased its function may, in part, be performed by the other, it is probable that, under ordinary circumstances, the portal vein ministers chiefly to the assimilating functions of the liver, transporting to it the nutriment absorbed by its branches from the stomach and bowels; while the hepatic artery ministers to its secreting function, the biliary acids and bile-pigment being secreted from arterial blood, like urea and uric acid, which in the kidney are secreted from the blood of the renal artery. This view is based on such facts as the following:—

1. In the Philosophical Transactions for 1793, a case is recorded where the portal vein passed direct to the vena cava inferior without entering the liver, and yet bile was found in the gall-bladder and intestines. Similar cases are referred to by Dr. Carpenter. (Principles of Human Physiology, fifth edition, p. 372.)

2. Many cases are on record where there has been complete obstruction of the portal vein from disease for some time before death, and yet bile has continued to be secreted. In 1856, Dr. Gintrac, of Bordeaux, collected thirty-four cases of obliteration of the portal vein in man, in not one of which was the biliary secretion interrupted. (L'Oblitération de la Veine Porte; Bordeaux. See also Frerichs, op cit., vol. i., p. 274; and Dickinson, Pathological Transactions, vol. xiv., p. 63.)

3. In animals, the portal vein has been tied by Oré and other experimenters, and yet bile has been secreted. The reduction in the quantity may have been due to the febrile disturbance created by the operation, or to the absence of the fatty ingredients of the bile which may be contributed by the portal vein. (Oré: Journ. de l'Anat. et Phys., 1864, p. 536; Carpenter's Human Physiology, seventh edition, p. 433; and Comparative Physiology, fourth edition, p. 424.)

4. Conversely, Kottmeier and Küthe found that no bile was secreted after ligature of the hepatic artery, although it is right to add that Schiff was unable to detect any diminution in a large dog upon which he had performed the same operation; and Röhrig observed only a slight diminution in the flow of bile after obstruction of the hepatic artery. (Carpenter, Human Physiology, seventh edition, p. 433; and Röhrig in Stricker's Jahrb. 1873, part ii.)

* Guy's Hospital Reports, series i., vol. i., p. 610.

† Sanderson, op. cit., p. 505.

‡ Budd, op. cit., p. 50.

§ On the Changes in the Liver which follow Ligature of the Bile-ducts. (St. Bartholomew's Hospital Reports, vol. ix., 1873.)

‖ Journal of the Chemical Society, October and November, 1863.

2. The destructive metamorphosis of albuminoid matter, and the formation of urea and other nitrogenous products, which are subsequently eliminated by the kidneys, these chemical changes also contributing to the development of animal heat.

3. The secretion of bile, the greater part of which is reabsorbed, assisting in the assimilation of fat and peptones, and probably in those chemical changes which go on in the liver and portal circulation; while part is excrementitious, and, in passing along the bowel, stimulates peristalsis and arrests decomposition.

B.—FUNCTIONAL DERANGEMENTS OF THE LIVER.

Keeping in view the functions of the liver in health, which I have endeavoured thus briefly to sketch, we shall be the better able to discuss the symptoms resulting from derangements of these functions. The few medical writers who have described the functional derangements of the liver have, like the late Dr. Copland, arranged them under the three following heads:—1, Diminished secretion of bile; 2, Increased secretion of bile; 3, Secretion of morbid or altered bile.* But this classification fails to recognise the most important functions of the liver; and, from what has been stated, it follows that the quantity and the quality of the bile discharged from the bowel, upon which the classification is based, are no certain tests of the amount and quality of the bile secreted by the liver. The quantity secreted being the same, the quantity discharged from the bowel will vary with whatever stimulates or impedes absorption. Any substance, like calomel or podophyllin, or certain articles of diet, which irritates the commencement of the small intestine, will sweep along the bile before there is time for its absorption, and thus cause an increased flow from the bowel, without the secretion by the liver being necessarily increased. Moreover, it must often be impossible to say whether the morbid or altered appearances of the bile in the fæces be due to a vitiated bile, or to changes which the bile has undergone in its passage through the bowel. For these reasons I have ventured to suggest another classification of the functional derangements of the liver, based upon what are now believed to be the normal functions of the gland, and upon the symptoms which a disordered liver may excite in the different physiological systems of the body.

Classification of the Functional Derangements of the Liver.

I. Abnormal Nutrition.
II. Abnormal Elimination.
III. Abnormal Disintegration.
IV. Derangements of the Organs of Digestion.
V. Derangements of the Nervous System.
VI. Derangements of the Organs of Circulation.
VII. Derangements of the Organs of Respiration.
VIII. Derangements of the Urinary Organs.
IX. Abnormal Conditions of the Skin.

I. *Abnormal Nutrition.*

Functional derangement of the liver may lead directly to (1) an abnormal deposition of fat, or to (2) the opposite condition of emaciation. Indirectly, also, the nutrition of the body may become seriously impaired from derangements of the disintegrative functions of the liver.

1. *Corpulence*, by which so many persons are inconvenienced, owes its origin to different causes. We know that it is very liable to occur in persons who eat much fat and take little exercise. In this case, the lacteals absorb more fat from the bowel than is sufficient to supply the carbon consumed in respiration, or there is a deficient consumption of fat in the system. Many facts, however, show clearly that the accumulation of fat is not due solely to an increased supply of fatty matter in the food, and its absorption by the lacteals. Thus of two persons consuming the same amount of fat, and taking the same amount of exercise, one will accumulate fat and the other will not; and in many persons the accumulation of fat appears to be one of the characteristics of old age, just as other persons, in growing old, wither and dry up. Again: some persons, with every care as to diet, cannot avoid getting fat, while others consuming much fat, as well as saccharine and starchy matter, remain permanently thin. And, thirdly, it is a fact established by many observations, both in man and in the lower animals, that fat is formed in large quantity from a diet containing much starch and sugar, and, from what has already been stated, it seems probable that the liver is mainly concerned in this transformation. Some of the fattest persons I have met with have been females, who have for a long time eaten little or no fat or oily matter, and who indeed have taken very little solid food, but who have contracted the habit of drinking frequently some mixture of alcohol and sugar, such as we find in beer, champagne, and other wines, and who at the same time have taken little exercise, and have suffered from symptoms of deranged liver. M. Dancel relates the case of a young lady, who, finding herself getting stout, and with the object of preserving her symmetry, fasted, as she thought, four days in the week upon champagne and *marrons glacés*; but with this diet she accumulated fat with frightful rapidity, and it was only after returning to a more rational diet that she regained her normal figure.* The tendency to accumulate fat, or the reverse, appears to be due to some constitutional peculiarity transmissible by parents to their offspring, and, from what we know of the functions of the liver, it is highly probable that it is the organ mainly at fault. Possibly there may be an abnormal proneness, or the reverse, to the conversion of glycogen into fat, in the manner suggested by Dr. Pavy; or, from some derangement of the liver, a larger proportion of the glucose derived from the food may be directly converted into fat than in health; or, in some instances, obesity may be due to a deficient oxidation of fatty matter. Although we can only as yet speculate as to the precise nature of the morbid process, we know that, in animals eating much farinaceous, saccharine, or oleaginous food, the proportion of fatty particles in the secreting cells of the liver is much greater than in animals moderately fed and taking much exercise.

Persons of a corpulent tendency are very liable to flatulence, constipation, heaviness, and weariness after meals, and other symptoms of hepatic derangement. After a time, they lose all appetite for solid food; they complain of great prostration and of sensations of sinking, which prevent their making much muscular exertion, and often encourage them in habits of tippling.

2. *Emaciation* may be induced by functional derangement of the liver in different ways.

(*a*) In consequence of a deficient formation of bile, or its impeded passage into the bowel, the assimilation of fatty and albuminous matters is interfered with. It is true that cases are occasionally met with in which the common gall-duct has been completely and permanently closed by a gall-stone, so that no bile could flow into the intestine, yet the body has been tolerably well nourished after upwards of twelve months.† There are, however, few exceptions to the rule, that permanent closure of the common bile-duct destroys life in the end—usually in little more than twelve months, if not before—by causing a gradual impairment of nutrition. Most patients with obstruction of the bile-duct dislike fat and cannot assimilate it, the fatty matters of the ingesta being, as already stated, discharged with the fæces. There are also reasons for thinking that the absence of bile from the bowel interferes with the absorption of peptones; while Dr. Legg's observation‡ that ligature of the hepatic duct in animals arrests the glycogenous function of the liver makes it probable that, when the flow of bile into the bowel is impeded, the nutrition of the body suffers in other ways than by the deficient absorption of fat and albumen. A deficient secretion or a morbid quality of bile may possibly lead to a similar result, though in a less degree.

(*b*) But, secondly, emaciation may result from derangement of the glycogenetic function of the liver. *Diabetes*, in fact, may be said to be in most instances a functional derangement of the liver. It would be out of place here to consider in detail what are now believed to be the various causes of glycosuria;§ but, briefly, they may be said to come under one of the three following heads:—

1. *Imperfect glycogenesis* in the liver. One function of the liver in health appears to be to prevent the immediate passage into the blood of the glucose derived from the food by converting it into glycogen. Thus Bernard has shown that, if a ligature be applied to the portal vein in an animal,

* Medical Dictionary, vol. ii., p. 723.

* Quoted by Dr. T. K. Chambers (Clinical Lectures, 1864, p. 547). I have failed to find the case in the Traité Théorique et Pratique de l'Obésité, par F. Dancel. Paris, 1863.

† Budd, op. cit., p. 40.

‡ Loc. cit.

§ These are well given by Dr. T. L. Brunton in his Lectures in the British Medical Journal for January and February, 1874.

so that the intestinal blood, rich in glucose, reaches the systemic circulation without passing through the liver, sugar at once appears in large quantities in the urine; and, in man, diabetes has been known to occur when the portal vein has been obliterated.* Again, if sugar be injected into the crural vein or into the rectum, it appears in the urine; but, if it be injected slowly into the portal vein, the urine will contain none.† The capability of the liver to convert sugar into glycogen is not unlimited. When, therefore, sugar is swallowed in excess of a certain quantity, it appears in the urine; and the same thing happens when much sugar or starch is taken after long fasting, owing to the rapidity of intestinal absorption; or when, in consequence of disease, old age, injury of the liver, unsuitable food, or some other cause, the glycogenetic function of the liver is impaired. Glycosuria, often temporary, from some of these causes is not uncommon. According to Bence Jones, in half of the cases of diabetes, the disease consists in an arrest of change in the food-sugar.

2. *An increased conversion of glycogen into sugar*, the destruction of the sugar remaining unaltered. In considering the functions of the liver, it was pointed out that the glycogen formed in it was partly converted into sugar, which disappeared in the lungs and muscles, but was probably mainly destined to support the nutrition of the blood and tissues throughout the body. Whatever, then, favours the reconversion of glycogen into sugar to an extent greater than can be consumed in the lungs and muscles, will lead to an excess of sugar in the blood and its appearance in the urine, and will to a corresponding extent interfere with the nutrition of the body. Now, whatever quickens the circulation of blood through the liver, particularly in the hepatic arteries, favours the conversion of glycogen into sugar, possibly by increasing the amount of albuminoid ferment already referred to; and accordingly, whatever paralyses the vaso-motor nerves of the hepatic vessels, either directly or indirectly, dilates these vessels, produces an increased flow of blood through them, and so leads to diabetes. The tendency of glycogen to become converted into sugar appears to be moderated in health by some nervous influence, on the removal of which the blood becomes surcharged with sugar, which enters the urine. Thus it is that diabetes is produced by irritation of the roots of the pneumogastric nerve in Bernard's "diabetic puncture," by certain injuries and diseases of the brain and spinal cord in man, by distress and anxiety of mind, by poisoning with woorari, and by injuries or lesions of the peripheral extremities of the pneumogastric nerve in the lungs, liver, stomach, or intestines.

3. *Diminished destruction of sugar.* If the sugar into which the glycogen formed in the liver is converted did not disappear from the blood, it would necessarily form one of the normal constituents of the urine. Hence it cannot be denied that the pathological presence of sugar in the urine may possibly depend in some cases upon a failure of the conditions under which the normal transformation of the sugar takes place. We are, however, in a great measure ignorant as to what these conditions are. A number of experiments make it probable that the sugar in the blood, under the influence of a ferment, is converted into lactic acid and glycerine, which undergo combustion, and so maintain the animal heat; and it is believed that when this ferment is absent the sugar is not decomposed, but is excreted in the urine. Whether this be the true explanation or not, many facts seem to show that diabetes may result from a morbid state of the blood. Thus, the introduction into the blood of ammonia, ether, chloroform, or phosphoric acid, is followed by glycosuria; while the introduction of carbonate of soda will prevent it. Prout long ago observed a saccharine condition of urine as not an uncommon result of gout; and glycosuria has been repeatedly observed in cases of pneumonia, whooping-cough, and phthisis, which lead to deficient oxygenation of the blood.

(*c*) It is not improbable that other wasting diseases are in their origin connected with some functional derangement of the liver. When there is derangement of the disintegrative functions of the liver, the blood and fluid effused from it become loaded with effete matter, as the result of which the nutrition of the tissues is often impaired, and the body wastes. In *phthisis*, again, long before tubercle is deposited in the lungs, there is evidence of deficient assimilation of nutriment and imperfect sanguification,—functions in which we know that the liver is deeply concerned. Again, the protracted purulent discharge which usually precedes *waxy disease* may entail a hasty and imperfect sanguification, resulting in anæmia and the formation of an albuminous material little capable of organisation.

II. *Abnormal Elimination.*

In discussing the functions of the liver, I stated that bile is in part excrementitious, although this is probably far from being its chief use in the economy of digestion. In accordance with the belief, still held by many members of the profession engaged in practice, that the chief function of the liver is to excrete bile, the retention of bile in the blood and tissues is believed to give rise to serious symptoms. For example, when such symptoms as delirium, stupor, muscular tremors, subsultus, carphology, paralysis of the sphincters, coma, convulsions, a dry, brown tongue, and other symptoms of the "typhoid state," supervene in any case of jaundice, in acute atrophy of the liver, or in the advanced state of cirrhosis, it is customary to attribute them to poisoning of the blood with retained bile. Experiments also have been performed on animals, with the object of showing that bile is a deadly poison. But that dogs should die after injection into the cellular tissue of the bile of other dogs admits of another explanation than that of the essential elements of bile being a poison. The injection of decomposing mucus would probably produce a like result. Pure bile, from which all mucus has been removed, has been repeatedly injected into the large veins of dogs by Frerichs and other observers, without any cerebral symptoms or bad results ensuing, except that in some instances death was caused by the entrance of air into the veins.* The operation has even been repeatedly performed on the same animal without any lasting injury. But it is scarcely necessary to have recourse to experimental researches on the lower animals for evidence on the matter, and in all these experiments there are sources of fallacy. Every medical practitioner must be familiar with the fact that the blood and tissues of man may be saturated with bile for months, without cerebral or any other symptoms of blood-poisoning resulting, so long as the glandular tissue of the liver is not destroyed, and the kidneys continue to perform their functions. Bearing such cases in mind, it is difficult to believe that bile is a deadly poison.

Reference has already been made to the views of an American physiologist, Dr. Austin Flint, jun., who has written a work to show that the cerebral symptoms which occasionally occur in jaundice and in structural diseases of the liver are due to the retention in the blood of cholesterin, or to what he has designated "Cholestearæmia."† Dr. Flint regards cholesterin as an excrementitious product of nervous tissue, the elimination of which from the body he believes to be one of the functions of the liver. Arrived in the bowel, the cholesterin, according to him, is converted into stercorin, and therefore it is not found in the fæces; but, when retained in the blood and tissues, he believes it be a virulent poison like urea. But if the non-excretion of all the elements of bile do not give rise to cerebral symptoms, it is difficult to understand how these symptoms can result from the retention of cholesterin alone. In cases, for instance, of permanent closure of the bile-duct, cholesterin is not discharged from the liver into the bowel; it does not accumulate in the biliary passages, nor, if it be present in the blood, does it necessarily give rise to cerebral symptoms.

From what has been stated, I think it must be clear that the cerebral symptoms which occasionally supervene in certain morbid states of the liver are independent of the non-excretion of bile or of any of its component parts. The real cause of these cerebral symptoms will be referred to hereafter.

The symptoms usually associated with a deficient excretion of bile are an irregular, usually costive, state of the bowels, the stools being insufficiently coloured with bile, and of a pale-yellow, drab, or whitish colour, loss of appetite, a

* See abstract of Lectures in London Medical Record for October and November, 1873.

† Pavy, Nature and Treatment of Diabetes, second edition, 1869, pp. 142-3; and Bence Jones, Lectures on Pathology and Therapeutics, 1867, p. 42.

* Diseases of Liver, Sydenham Society's translation, vol. i., p. 395.

† Op. cit.

white or yellowish furred tongue, a disagreeable, often bitter, taste in the mouth, especially in the morning, flatulence, a sallow or muddy tint of skin (indicating, unless there be concurrent hyperæmia of the liver, anæmia rather than jaundice), dingy conjunctivæ, languor and disinclination for exertion, frontal headache, dulness and heaviness, drowsiness after meals, great depression of spirits, and sometimes hypochondriasis, and frequent deposits of lithates in the urine on cooling. These symptoms are very apt to be induced, especially towards middle life, by sedentary or indolent habits, the habitual use of rich or indigestible food, neglect of the bowels, great or protracted anxiety of mind, or by a general want of vigour, consequent upon disease of the heart or some other organ and the tendency to them is in many cases inherited. They are commonly, and perhaps correctly, ascribed to what is called "torpor of the liver"; but the non-excretion of bile may possibly be merely one of the symptoms, rather than the cause, of the morbid state, the real cause being the retention in the system, not of bile, but of those products of disintegration which it is the purpose of the kidneys to eliminate. At the same time, it is very probable that engorgement of the liver with bile interferes with the normal processes of disintegration of albumen which take place in the gland.

Clinical Lectures
ON
BLOODLESS OPERATING,
AND
BLOODLESS OPERATIONS AS ILLUSTRATED BY THE USE OF THE GALVANIC CAUTERY.

Delivered in Guy's Hospital,

BY THOMAS BRYANT, F.R.C.S.,
SURGEON TO THE HOSPITAL.

LECTURE II.—PART II.

THE cases I have hitherto brought before your notice have, I hope, demonstrated with sufficient force the value of the galvanic écraseur as an amputating instrument, and at the same time shown that the operations which have been performed by it may justly claim the character of being bloodless. In those I am now about to relate, the value of the galvanic cautery as a caustic will be illustrated; and I think I shall be able to satisfy you that, as such, for the treatment of lupus, epithelial or skin cancers, and some forms of nævi, it possesses advantages such as are not equalled by any other means the surgeon has at his command. It is applied with facility, certainty, and success; and it has rendered the treatment of these hitherto troublesome affections comparatively a simple matter; for in many of the cases I am now about to relate, one application of the galvano-caustic was sufficient to set up a new action in the part, and heal a lupus, destroy a cancer, or cure a nævus.

CASES OF LUPUS CURED BY THE GALVANIC CAUTERY.

CASE 1. *Lupus of face of four years' standing; cautery; cure.*—Caroline E——, aged twelve, came under my care on Jan. 4th, 1872, with a large patch of lupus covering the left cheek and extending from the left ear to the nose and chin. It had commenced four years previously as a tubercle. The tubercle at that time was cut out, but the wound never healed; indeed, it ulcerated, the ulceration spreading gradually in spite of all treatment. On Jan. 5th, with the patient under chloroform, I applied the galvanic cautery to the whole surface of the sore, and covered the parts up with a piece of gutta-percha and cotton wool. A healthy action followed this operation, and a steady cure, the patient leaving the hospital, well, on Jan. 29th.

CASE 2. *Lupus of face of four years' standing; cautery; cure.* (Reported by Mr. Manby.)—Eliza T——, aged thirty, came under Mr. Bryant's care in November, 1868, with a lupus covering the whole nose and upper lip. It had been gradually spreading for four years in spite of treatment. On Nov. 6th Mr. Bryant cauterised the whole surface freely with the porcelain cautery. In thirteen days the scab fell off, leaving a healthy healing surface. By Dec. 3rd, or the twenty-seventh day after the operation, the part had completely healed.

CASE 3. *Lupus of twenty years' standing cured by the application of the galvanic cautery.*—Mary W——, aged thirty-eight, came to me on April 22nd, 1868, with a patch of lupus, the size of a florin, on her nose. It had existed for twenty years, and no kind of treatment had been of any service. I destroyed the whole mass at one sitting with the porcelain cautery, and charred it into a hard leathery eschar. On May 12th, when I saw her again, the surface had nearly healed.

CASE 4. *Lupus on the nose and cheek; galvanic cautery; cure.*—Mrs. H——, aged sixty-five, of Fairford, Gloucester, consulted me in July, 1873, for a lupus involving the nose and cheek. It had been of some years' standing, and had spread in spite of treatment. On July 9th I thoroughly destroyed the growth by the galvanic cautery, and when the eschar came away a healthy surface appeared, which rapidly healed. Her medical attendant, Mr. Cornwall of Fairford, reported to me in November that she was quite well.

CASES OF EPITHELIAL CANCER CURED BY THE CAUTERY.

CASE 1. *Epithelial cancer of the ala of the nose; galvanic cautery; cure.*—Honore S——, aged fifty, came under my care in February, 1868, with an epithelial cancer, of the size of a sixpence, on the ala of the nose. I destroyed it completely by one free application of the galvanic cautery, and a good sound cicatrix was the result.

CASE 2. *Cancer of nose of four years' standing; galvanic cautery; cure.*—Mary ——, aged sixty-four, came under my care on Jan. 8th, 1871, with a cancer involving the ala of her nose. It had commenced four years before, and, in spite of treatment, had spread. I applied the cautery to its surface and destroyed it, a rapid recovery taking place.

CASE 3. *Epithelial cancer of the nose of four years' duration; galvanic cautery; recovery.* (Reported by Mr. Ticehurst.)—Sarah B——, aged fifty-three, who had had an epithelial cancer on her nose for five years and every form of treatment applied, came to Mr. Bryant in October, 1868. The growth was near the right ala, and was about the size of a sixpence. He freely destroyed it by means of the galvanic cautery; on the third day the dry eschar fell off, and the wound healed in a week. Nine months afterwards some recurrence on the spot took place, which was treated in the same way and with a like result.

CASE 4. *Epithelial cancer of the nose and eyelids; galvanic cautery; cure.*—On Feb. 26th, 1868, Mrs. P——, aged fifty-five, applied to me with an epithelial cancer that involved the bridge of the nose and the inner angle of the eye. It had been growing for a year and a half. I destroyed it completely with the galvanic cautery, and a good cure ensued.

In this case, on account of the position of the cancer, it would have been difficult to destroy the disease with safety in any other way.

CASE 5. *Epithelial cancer of the scrotum (sweep's); removal by cautery; recovery.*—George H——, a sweep, aged fifty-eight, was admitted into Guy's Hospital, under Mr. Bryant's care, on July 8th, 1868, with a large cancer of the scrotum, the size of a crown. On Oct. 30th Mr. Bryant, with the patient under the influence of chloroform, destroyed the whole with the galvanic cautery. No bleeding attended the operation; and after the operation the man said he was in less pain than he had been before. On the seventh day the eschar came away, and the wound rapidly healed.

CASE 6. *Epithelial cancer of the scrotum (sweep's); destruction with the cautery; cure.*—James H——, aged thirty-five, a sweep, came under my care in April, 1868, with an epithelial cancer, the size of a crown-piece, upon the scrotum. I destroyed it completely with the galvanic cautery, and when the eschar came away a healthy wound existed, except at one spot. This was touched again by the cautery on April 22nd, and by April 29th the parts had healed.

CASE 7. *Fungating sore over malar bone of seven years' standing; cure after the application of the galvanic cautery.*—William H——, aged sixteen, came under my care in March,

1868, with a peculiar fungating sore over the left malar bone of seven years' standing, which had followed the bite of a horse. It was about the size of a shilling, and had irregular thickened edges. I destroyed it completely with the galvanic cautery on March 12th, and by April 1st the wound had healed. On April 20th a soft pliable cicatrix existed.

ON THE TREATMENT OF NÆVI BY THE GALVANIC CAUTERY.

That nævi may be destroyed and cured by means of the galvanic cautery must be such a familiar fact to you, gentlemen, who have followed my practice at this hospital, as to make it appear quite unnecessary for me to bring the subject before you on the present occasion, and so far as some of you are concerned you are right; but as it is through you that I want others to know the value of the practice I am now advocating, I propose to point out the forms of nævi which are likely to be benefited by the treatment, and the different ways in which it is to be applied; and I shall do this as briefly as possible.

With regard to the forms of nævi that are likely to be benefited by the practice, I would remind you that nævi are met with in three varieties: (1) the purely skin nævus, that involves the skin alone, and appears as a more or less extensive and bright vascular mark; (2) the purely subcutaneous nævus, that involves the cellular tissue placed beneath the skin, and that does not affect the integument over it; and (3) the mixed form of nævus, which affects both tissues, beginning either in the skin and spreading deeply, or in the cellular tissue and growing forwards. Of these three varieties the first and the last are the more amenable to the treatment by the galvanic cautery; the first with a good certainty of securing a successful issue, and the last with a fair certainty. The purely subcutaneous may be so dealt with, but in a general way these cases are better treated by excision or by subcutaneous ligature.

In the treatment of the purely skin nævus the surgeon must take care that the whole thickness of the vascular tissue is destroyed. He must burn it down, by means of the platinum point, spatula, or porcelain cautery, till the whole is destroyed and carbonised. He must see that the margins of the growth are freely cauterised as well as its centre; the base of the disease as well as its surface. He must not show any timidity in the use of the burning instrument; he must use it boldly, to the complete destruction of the vascular structure. He must so cauterise the whole nævus as to turn it into a brown, non-vascular, solid eschar. Where failure has followed the use of the cautery in these cases it has been from want of attention to these points.

In the treatment of the mixed variety of nævus the same care is called for, and the same boldness of execution; but something additional is required, and that is the perforation of the subcutaneous portion of the nævus with the heated wire. The whole mass should be riddled in all directions: the platinum wire should be introduced into it vertically, transversely or obliquely; every part of its structure should be brought under the influence of the cautery, and under such circumstances the withering of the whole may with some confidence be looked for. In all the cases in which I have adopted this practice good success has been secured; when failure has followed it has been from a want of due attention to its details. The success, indeed, has been so good that in the purely subcutaneous variety of nævus I am disposed to think an equal amount of success is to be gained by an equal attention to the application of the cautery to the deeper parts. The success I have hitherto acquired by following this practice has encouraged me to give this opinion. The following cases will, however, best illustrate the subject.

Cases of Nævi cured by means of the Galvanic Cautery.

(From notes by Mr. A. R. Manby.)

CASE 1.—Wm. G——, aged ten weeks. Nævus the size of a sixpence involving the skin over the right frontal eminence. On March 5th, 1869, the growth was cauterised by means of the porcelain galvanic cautery. In ten days the slough came away, and a white cicatrix was left, no signs of the disease being visible.

CASE 2.—Charles J. E——, aged twelve months. Nævus involving the tip of the nose, alæ, and septum, with part of the upper lip. It had been vaccinated without any good effect. On Nov. 7th, 1865, Mr. Bryant cauterised the whole with the porcelain cautery. On the 15th the eschar fell off, and by the 30th the parts were well, no signs of nævus being visible.

CASE 3.—Mary G——, aged five months. Nævus the size of a shilling at the inner angle of the left eye, steadily growing. It had been vaccinated three times with no good effect. On October 30th, 1868, the whole surface was deeply cauterised and burned into a dry eschar. On Nov. 12th the scab was still adherent.—26th: The scab fell off three days since; cicatrix healthy; no sign of disease to be seen.

CASE 4. — Robert C——, aged sixteen months. A *mixed* nævus, the size of a sixpence, over the right forehead. On Nov. 13th, 1868, it was cauterised freely, and then punctured in all directions. On Nov. 21st the scab came off, leaving a healthy scar; and by the 26th the child was cured.

CASE 5.—Agnes W——, aged four months. A nævus, the size of a florin, over the right side of the forehead. It was freely cauterised on Oct. 30th, 1868. On Nov. 5th the scab was adherent, and on the 16th it came off, leaving a healthy scar. On the 26th the child was quite well. On Jan. 13th, 1869, a white movable cicatrix existed.

CASE 6.—Alice C——, aged four months. A *mixed* nævus, the size of a crown-piece, on the side, growing rapidly. On Jan. 8th, 1869, the whole was deeply cauterised and perforated in all ways. The scab came off on the 18th, and on the 20th the parts had nearly healed. On the 28th a healthy scar existed. A month later the scar was white, and no signs of disease could be made out.

CASE 7.—William S——, aged five months. A nævus, the size of a shilling, on the nape of the neck, of the *mixed* variety. On Nov. 6th Mr. Bryant punctured the swelling in all directions with the heated galvanic cautery wire. The growth on the sixth day had become quite solid from inflammatory induration. In one month it had disappeared. On Feb. 1st, 1869, beyond the scars of the punctures, no signs of the disease could be made out.

CASE 8. — Emily M——, aged thirteen months. A *subcutaneous* nævus, the size of half a walnut, in the right cheek. It had been ligatured subcutaneously, without any good result. On Oct. 30th, 1868, Mr. Bryant punctured the swelling freely from within the mouth with the wire of the galvanic cautery. On Nov. 12th it had become perfectly consolidated, and in six weeks the whole disease had disappeared. In February, 1869, no evidence of the affection was visible.

CASE 9. — Mary H——, aged three months. A *mixed* nævus, two inches and a half long by an inch wide, under the chin. On Oct 30th, 1868, the whole was freely cauterised with the porcelain galvanic cautery, and then punctured in all directions. On Nov. 12th the nævus was quite hard and solid; and on the 19th the scab came off, leaving a healthy scar, no signs of the disease being visible. On the 5th of March a suspicious spot the size of half a pea was seen and destroyed, a good recovery taking place.

CASE 10.—James M——, aged one year. A *mixed* nævus, the size of a shilling, in the centre of the forehead. On Jan. 8th, 1869, the growth was perforated in all directions by the heated wire of the galvanic cautery; it subsequently consolidated and then gradually disappeared, the child leaving London, cured, in six weeks.

CASE 11.—Richard H——, aged five months. A nævus of the *mixed* kind on the anterior border of the axilla. On the 16th of April, 1869, Mr. Bryant removed it by means of the galvanic écraseur, having passed beneath its base two hare-lip pins. The operation was bloodless. A rapid recovery followed.

CASE 12.—Mary D——, aged twenty-one months. A *mixed* nævus, the size of half a walnut, over the frontal eminence. On Feb. 26th, 1868, destruction of the whole was effected with the galvanic cautery. On the tenth day the scab came off, leaving a sound cicatrix.

I have selected these cases to bring before you because they were some of the earliest I had to treat, and also because notes of them were taken by one of my then dressers. They may be read as types of the very many I have dealt with since, and of which I have not kept notes. As I described to you in my former remarks, you will have observed that in the simple nævus the mark was cauterised from its surface; in the mixed variety it was cauterised and perforated; in the subcutaneous it was perforated alone; and in one case the mixed nævus was removed as a whole with the écraseur. In all of these cases the operation was almost bloodless from first to last.

In some cases of nævi it is not necessary to destroy the whole. I have had several in which one of the eyelids was involved down to its ciliary border. In these I have been content with destroying half the growth, leaving the ciliary half alone; and I have been pleased to find that the ciliary portion of the disease subsequently disappeared, the redness gradually going, and leaving the skin white and pliable.

The same result has followed a like practice in a case in which one ear and cheek were involved, the destruction of part of the growth being followed by the withering of the whole. The most active part of the growth in all these cases was selected for destruction.

In extensive nævi, with these facts before us, it is consequently wise to deal with them piecemeal—to destroy a spot the size of a shilling at different parts of the growth; to cauterise the surface of the nævus when the skin is involved, and the deeper part by perforating it when the cellular tissue is affected; and in some cases it is well to make a clean sweep of the heated wire through the base of the growth;—the object under all these circumstances being the same—to destroy the vascular tissue, and excite sufficient inflammatory action in its deeper parts to cause what remains to wither. The larger and more extensive nævi may be thus treated with every probability of acquiring a successful result.

The cicatrices which follow the cure of these nævi by means of the cautery are singularly good. They are mostly white, and, as a rule, movable—more particularly when the nævus is thoroughly destroyed in one operation, and the eschar is allowed to dry up and drop off, the deeper parts being allowed to heal by scabbing. Why this should be I will not detain you to consider, but the clinical fact is a good one to bear in mind.

ABSTRACT OF

Lectures

ON

ELECTRO-THERAPEUTICS.

Delivered at Charing-cross Hospital,

BY G. VIVIAN POORE, M.D.,

ASSISTANT-PHYSICIAN TO THE HOSPITAL, ETC.

LECTURE I.

PRINCIPLES INVOLVED IN THE CONSTRUCTION OF GALVANIC BATTERIES.

AFTER pointing out that electricity was used in medicine in three distinct forms—galvanism, faradaism, and franklinism,—which were employed for widely different purposes, and were on no account to be confounded together, the lecturer passed to a consideration of those principles of galvanism which would enable a medical man thoroughly to comprehend the nature and construction of any apparatus he might possess.

Galvanism, or the battery current, owes its origin to chemical action which is usually allowed to take place in a series of cells. These cells are called galvanic elements, and, in their simplest form, consist of two plates of different metals immersed in a fluid capable of acting chemically upon one of them (e. g., copper and zinc in dilute sulphuric acid). The two plates being united by a copper wire, an electric current immediately begins to circulate in a definite direction, travelling *in the cell* from the zinc plate to the copper plate, and *outside the cell* from the copper to the zinc. If the conducting wire be cut in two, the end which is in contact with the copper is called the positive pole, and that which is in contact with the zinc the negative pole. It is important to remember that the current always travels from the positive to the negative pole. If a series of such cells be joined together, the copper of one being joined to the zinc of the next and so on, or else all the zincs being united to one end of the conductor and all the coppers to the other, we get what is called a galvanic battery. The effect produced varies immensely according to which method of uniting the cells is adopted.

Such cells as those described are inconstant in action, and deteriorate rapidly from the first moment of being put in use. This is due to the solution of the zinc in the acid, the rapid neutralisation of the acidity of the liquid, and the deposit of bubbles of hydrogen and metallic zinc upon the copper plate. To obviate this difficulty, so-called "constant elements" have been devised. These were all minutely described, and their mode of action explained; but in a short abstract a mere mention of them must suffice. The best known is Daniell's element, which has been largely used for medical purposes under its modified forms, known as the Becker-Muirhead and the Siemens-Halske element. Grove's element, and the modification of it known as Bunsen's element, are among the most powerful elements known, and in their original form are used only for the galvanic cautery. The Leclauché element, Smee's element, Stöhrer's element, and other varieties were all fully explained.

The division of bodies into conductors and non-conductors of electricity was next entered upon. The best conductors are the metals, and one of the best of these is copper. Carbon is a good conductor, but inferior to the metals. Acid liquids conduct more feebly than the metals, but far better than distilled water. The animal body conducts electricity very feebly indeed. Certain bodies, such as guttapercha, glass, and porcelain, do not conduct it at all, and are called insulators. No bodies are perfect conductors. Even the best conductors offer some *resistance* to the passage of the current. The resistance offered by copper and some other metals is very slight, and they are said to have a low *specific resistance*. Liquids have a high specific resistance. The specific resistance of a solution of sulphate of copper is said to be ten million times that of pure silver. The human body is a very bad conductor, and its resistance has been rightly spoken of as "colossal." The resistance offered by the Atlantic cable is not nearly so great as that offered by the human body. The resistance offered by a conductor not only depends upon its specific resistance, but is found to be directly proportional to the length of the conductor and inversely proportional to the area of its cut section. Long fine wires offer far more resistance than short thick ones. Liquids obey the same laws as metals, and accordingly it is found that a thin layer of large surface of a liquid of high conducting power, such as strong nitric acid, conducts far more readily than a thick stratum of a liquid of lower conducting power, such as water, dilute sulphuric acid, or a solution of sulphate of copper.

The different elements described have not all the same *electro-motive power*, or the power of propelling, as it were, the electricity generated in them. This electro-motive power depends upon the violence of the chemical action taking place in the cell. Taking the electro-motive force of a Grove's element as 100, that of Bunsen's is 98, Daniell's 56, and Smee's scarcely half that of a Daniell.

The *intensity* of a current depends upon the quantity of electricity which in a unit of time flows through a section of the circuit. *And in all parts of the circuit the intensity is always uniform.*

The intensity of a current is equal to the electro-motive force divided by the resistance. This is Ohm's law, a right understanding of which is indispensable. It is formularised thus: $I = \frac{E}{R}$.

Now resistance is of two kinds: the resistance met with in the battery itself, called *internal resistance*, which may be designated by R; and the resistance met with in the circuit, called *external resistance*, which may be designated by r. Our formula thus becomes $I = \frac{E}{R+r}$. If we increase the number of our elements (say six times), our formula is $I = \frac{6E}{6R+r}$; for by increasing the number of elements we increase equally the internal resistance.

The effect of increasing the number of elements differs immensely according to the value of r. Now r may be practically *nil* (as is the case in the battery for the galvanic cautery, where the circuit is completed by a short length of high conducting wire), and in that case we do not increase our intensity by increasing the number of the elements. Thus, $I = \frac{6E}{6R+r}$; but r may be neglected, and we get $I = \frac{6E}{6R} = \frac{E}{R}$. Our first deduction from Ohm's law is

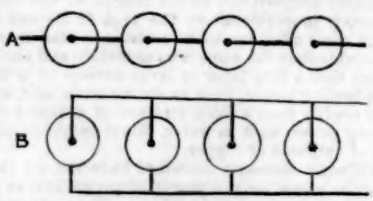
therefore, "*When the resistance of the circuit is insignificant in comparison with the resistance of the battery, the intensity of the current is not increased by the multiplication of the elements.*"

Let us next suppose that R is insignificant, and that r is colossal, then in our equation R may be neglected, and we get $I=\frac{6E}{r}$. We have thus increased our intensity six times. Ohm's second rule is therefore, "*When the resistance of the battery is insignificant in comparison with that of the circuit, the intensity of the current increases proportionally to the number of the elements.*"

Let us once more suppose r to be insignificant, and, instead of multiplying our elements by 6, let us increase their area six times. Now, we have said that the resistance of a conductor is inversely as the area of its cut section, so that our equation becomes $I=\frac{E}{\frac{R}{6}}=\frac{6E}{R}$. The third rule, then, is as follows:—"*When the resistance of the circuit is insignificant when compared with the resistance of the battery, the intensity of the current increases in proportion to the surface of the elements.*"

When R is insignificant compared with r, it is obvious that we get a negative result by increasing the surface. Ohm's law, therefore, may be summarised thus:—"*When one has to deal with very great resistance in the circuit, the intensity of the current is increased by multiplying the number of elements, without regard to their surface, which may be as small as one likes. If, on the contrary, the resistance in the circuit is very small, then the same end is attained by increasing the surface of each element without increasing their number.*"

Now, when we unite a number of elements to form a battery, we may do so in two ways, as stated above. When we unite the cells in a sequence, the copper of one being joined to the zinc of the next, as at A (see diagram), we



have an arrangement capable of overcoming external resistance. When, however, we unite all the zincs on one side, and all the coppers on the other (as at B), practically speaking, we enlarge the surface of our elements, and we get an arrangement which is said to furnish a large "quantity" of electricity, but which is of small power for overcoming external resistance.

In the medical batteries the elements are arranged invariably as at A, and their rearrangement is not provided for, so that we are always compelled to use two separate batteries for the galvanic cautery and for electro-therapeutics proper. With big stationary batteries, such as those supplied by Messrs. Elliott, it might be possible to arrange for a double method of uniting the elements, so that one battery should serve two purposes.*

The *tension* of a current has been defined as the tendency of the electricity accumulated at the poles to free itself and overcome obstacles. Franklinic electricity has a far higher tension than galvanic.

Density is another term occasionally used. We stated that the intensity of a current was the same in all parts of the circuit. Now if one part of the circuit be composed of a wire having only half the sectional area of the rest of the circuit, it is evident that the density of the current in that part will be double what it is elsewhere; for we have the same quantity of electricity squeezed, as it were, into half the space.

* Since this lecture was delivered, Messrs. Mayer and Meltzer have constructed a highly efficient battery for the galvanic cautery, which is composed of carbon and zinc elements of small surface, united in the manner indicated in the diagram B. The exciting liquid consists of bichromate of potash and dilute sulphuric acid. This cautery has great power, is very portable, is easily kept in order, and emits no fumes.

REPORT OF A CASE OF

PHLEGMONOUS ERYSIPELAS OVER THE LEFT GLUTEAL REGION SUCCESSFULLY TREATED BY THE ASPIRATOR.

BY FREDERICK HALL, M.R.C.S.

(*With a Note by* Dr. RICHARDSON, F.R.S.)

History, &c.—Mrs. B——, aged forty-four years, married and the mother of three children, hitherto enjoying an average share of good health, of active and industrious habits; hair and irides dark-brown, temperament of the nervo-sanguineous type. For eight or nine years this patient says she has, at various times, experienced a dull, aching kind of pain over the sacrum and left gluteal region, which continued for variable periods, and frequently caused her considerable distress. She has sought professional aid to relieve her of this pain on several occasions, but of late she has tried various quack remedies with varying advantage. A few weeks before consulting me she had applied over the hip and upper third of the thigh, on its outer aspect, two or three quack plasters, with, she imagined, some advantage. During the months of October and November of last year her hip was very painful, and she was also at this period much excited and exposed to great maternal anxiety, owing to the serious illness of her children. Late in November she, with her family, visited Devonshire for a change, but while there the youngest child was attacked with pneumonia, which caused her much anxiety and care while nursing the little invalid; and for three days and nights she had but little rest. About this time she again experienced increased discomfort and pain over her left hip, from the plasters having irritated the surface over which they were applied, and "had drawn it very much, causing a free discharge of a yellowish-coloured watery fluid, which, on drying, stained and stiffened the body-linen in contact with the affected hip." She now removed the plasters, and noticed the surface of the hip and thigh, where the plasters had been, to be discoloured and covered with several suppurating papillæ having inflamed and rather firm bases. She applied warm fomentations to the hip occasionally. The child convalescing, she returned to town to her own home and sent for me the day after her arrival (Dec. 3rd, 1873). She was in bed, looking anxious, in pain, and also much depressed, complaining of headache, sleepless nights from her rest being broken by the dull aching pain which constantly remained in her left hip, from which she cannot turn in her bed without much difficulty and pain; and this necessitates her keeping constantly on her back. The left inguinal glands are tender and swollen. She gave me the above history of her case, and thinks her present sufferings are due to the same pains which for the first time occurred nine years ago, after the birth of her first child. The pain she describes as being of a dull, aching, distressingly wearying kind, which extends over the left hip near and around the joint, along the outer and posterior portion of the thigh, down to the popliteal space, involving the knee-joint, and at times reaching to the outer ankle. On examination, I found the left hip to be decidedly larger and rounder than the right one, also to be somewhat tender when compressed—especially is this the case over the course of the great sciatic nerve and about the great trochanter. The general surface is of a dull reddish-brown colour, probably from the effects of the plasters; while some score or so of suppurating papillæ, with inflamed and hardened bases, are scattered over it. No pitting from digital pressure is noticed, neither is there any fluctuation detected, nor is the skin anywhere unusually firm or inelastic. The articulation of the hip is free from tenderness and pain; it can be used freely without any especial difficulty being experienced, except when *rotation outwards* is fully made—then the patient says she suffers much pain and cries out. Progression is made with a feeling of stiffness and restraint about the joint, external to and within it, so that she readily seeks a resting-place. As night comes on all the worst symptoms are intensified. The menstrual period is just completed.

The tongue is moist and clean; appetite tolerable, thirst slight; pulse 84—90, soft, regular, and steady. Pulmonary and cardiac condition satisfactory.

Treatment and progress of the case.—As I regarded the case to be a masked form of sciatica due to rheumatism arising from cold, fatigue, and exposure, I advised her to keep in bed for a day or so, and to apply the following lotion over the sores:—Oxide of zinc, and calamine, of each three drachms; glycerine, four drachms; emulsion of almonds, to four fluid ounces: to be painted freely with a soft brush over the tender parts during the day; whilst at night a warm poultice of linseed-meal was to be applied over the hip. A plain but liberal kind of diet, and this mixture, in one-ounce doses, ordered:—Sulphate of quinine, half a scruple; tincture of perchloride of iron, one drachm and a half; syrup of ginger, one ounce; water to eight ounces.

Dec. 10th.—In some respects she has improved, is more cheerful and strong, being in an easy chair in another room. She occasionally walks about the room to superintend small domestic affairs. The general surface of the gluteal region is more natural in its condition, the papillæ being almost all removed; but the tenderness between the great sciatic notch and great trochanter is more marked. From not sleeping at night, thirty-five grains of hydrate of chloral, in a draught, was given last night, with but small advantage. Continues the mixture and poultices.

20th.—On the 15th, feeling so much easier and stronger, and the weather being unusually mild and dry, she had some carriage exercise, and thinks herself much benefited by the change, although the motion of the vehicle, when passing over the stones, caused increase of pain to the hip. For the first time, she last night experienced distinct rigors; and this morning when she awoke she felt faint, and was damp from a rather profuse kind of perspiration. Slight hysterical symptoms are now present: she is tearful and rather excited. The tongue has an over-clean and glazed appearance; the pulse is full, and from 94 to 96. The urine, formerly pale and clear, is now higher in colour, and rather turbid; on examination, it was found to be acid, of the specific gravity of 1·18, and containing an excessive amount of both the triple and earthy phosphates. The affected hip is now more rounded, its surface over the space above mentioned is distinctly red, while on pressure increased tenderness and an obscure fluctuation are noted. The case is now determined to be one of deep phlegmonous inflammation; and she was accordingly advised to rest more in bed, and to continue the poultices, mixture, &c.

26th.—There is now well-marked œdema of the left foot and ankle, while a dense eczematous rash covers the whole of the dorsum, the burning and itching of which distress the patient exceedingly, especially at night. The dorsum, or wherever the eczema shows itself, is to be occasionally well painted with the lotion ordered on the 3rd. The right ankle is also a little swollen and tender, so that now the recumbent position is imperative. The natural functions are all good; but the patient, who is emaciating, is worn out by nocturnal pains, insomnia, and perspirations. To add twenty minims of dilute phosphoric acid to each dose of the iron and quinine mixture; to induce sleep, forty to sixty grains of chloral hydrate are required, with advantage; and poultices are to be applied over the hip every two hours.

30th.—The character of the patient's condition being advanced, but being very much excited by the proposed use of the lancet or bistoury, I obtained with her ready consent the opinion of Dr. Benjamin W. Richardson, who confirmed my view of the case, and after having, by means of a grooved needle, satisfied ourselves of the presence of pus deeply seated, he advised the continuance of the poultice; and, as the patient is so depressed by the idea of the bistoury being used, he proposes to-morrow to empty the abscess by means of Dufosse's aspirator.

31st.—A circumscribed and distinct fluctuation can be detected over the hip, near to and a little below and to the outside of the great trochanter, in a space about two or three inches in diameter, and, compressing this space rather firmly, a little coloured pus flows from the opening made by the exploring needle. The ether spray was used over this space, so that the patient should be spared all avoidable pain possible, and about an inch of the integument was frozen, when a No. 3 hollow needle was passed through the small existing opening, and forced gently for some two inches downwards, the receiver of the aspirator being previously exhausted. On turning the tap, and connecting the hollow needle with the receiver, pus, at first sluggishly, afterwards more freely, began to flow from the abscess sac along the connecting-tube into the receiver, which, after being exhausted two or three times more by the pump, was removed, and found to contain six or seven ounces of thick and rust-coloured pus. On removal of the needle, the opening was dressed with carbolised resin ointment spread upon linen, while a fresh warm large poultice was placed over the hip. After the operation—which the patient said was not painful, a sucking kind of feeling being experienced in the part (disagreeable rather than painful)—the hip was flatter, paler, and smaller. From beginning to end the operation did not extend over more than five minutes, and was very clean and efficient, successfully removing all the pus that had formed in the sac. Some little amount of wine was given her at the commencement. To have one drachm of syrup of iodide of iron in water three times a day, with improved diet, including wine. All other medicines discontinued, excepting a chloral hydrate draught at night, if requisite, to promote sleep.

Jan. 3rd, 1874.—A very free escape of pus took place yesterday on the poultices and while dressing the part, some four or five ounces being so removed through the small opening in the skin. To-day this flow continues freely, but in a less amount. The ankles are now of the natural size, and the left leg and thigh of their natural size nearly; the entire limb is also free from pain, and capable of easy motion. The integument of the hip is paler in colour, and possesses a softened and elastic feel. An elastic bandage is now applied from the toes up to and over the upper third of the thigh. The patient is very cheerful, and gets up daily to a sofa in an adjoining room. She is free from pain in any degree distressing, "feeling only a little stiffness and soreness in the skin of the hip." Sleeps well and naturally. She continues to take the drachm of the syrup of iodide of iron in water three times daily. Appetite is good.

7th.—In her sitting-room reading. All poultices discontinued since yesterday, a little carbolised resin ointment on linen being only applied over the hip, which, on standing for some short time, feels weak and tired. She can walk with greater freedom, but refrains from doing so. A few drops of a colourless fluid only flows daily from the closing wound. Continues as before.

13th.—Convalescent. Has taken carriage exercise since the last report, and found the motion agreeable, and not, as formerly was the case, painful to her hip. Since the 8th the lower two-thirds of the thigh has been surrounded by strips of common strapping, while the elastic bandage is carried over from the toes upwards. This treatment of the limb has been a source of comfort to the patient, by affording her a kind of support. Owing to an attack of eczema over the entire surface of the limb, from the foot upwards to the lower portion of the thigh, both the strapping and bandages were removed yesterday, and the calamine and zinc lotion freely painted over the eruption with advantage. She has discontinued the syrup of iodide of iron for a few days, and now takes six grains of carbonate of ammonia in an ounce of decoction of chinchona three times daily. Dr. B. W. Richardson saw this patient again to-day, and was satisfied both with her condition and the result of her treatment. He has advised her going into the country for a week or two to complete the restoration of her health.

From Jan. 17th to the 30th this lady resided at Lewes. She called upon me in February, looking cheerful and in the enjoyment of her usual health. She states that her hip is of no trouble to her now, that she can walk freely and well for a reasonable time, feeling at times only a little stiffness about the seat of the operation. She expressed her pleasure in finding herself so well after what threatened at one time to be a very serious illness. All treatment since January 23rd suspended, and the patient has resumed her usual habits.

Jermyn-street, W.

Note by DR. RICHARDSON.

The case related by Mr. Hall is of great practical value. On the old and, taking it all in all, sound principle of surgical practice, that whenever the bistoury can safely reach pent-up purulent matter, it should be brought at once into use, we should a few years ago have made, in this case, a free incision through more than an inch of sound tissue;

should have let air freely into the cavity as we let the purulent fluid out; should have left an extensive surface exposed to air, and to further rapid suppuration;—in a word, we should have turned a closed into an open wound. By the aspirator we may be said to have effected subcutaneously all that was required. We emptied the cavity, and instead of exposing its surface to the air, we brought them close together, and effected at once a rapid radical cure. In using the aspirator, we made an observation which has been omitted by Mr. Hall, but which is of moment—viz., that together with the escape of purulent fluid there was a free escape of gas, so that the fluid itself was charged with bubbles of gas, and the great relief of tension at once experienced was, I am sure, due largely to this escape. In opening large and deep abscesses by free incisions, we do not notice readily this phenomenon of exit of gaseous matter; but I suspect it always occurs, and that, in fact, the force which first distends the tissues, in abscess, is derived from liberation and expansion of gaseous products. It would be easy now, in using the aspirator, to collect the gas that escapes from suppurating cavities and to determine its chemical nature. Considerable simplification is required in the aspirator, in order to make its application ready for the hand of every practitioner in all emergencies. But the advance in principle is so certain that improvement in detail will readily follow.

One other little practical point is of value when ether spray is used for preventing the pain caused by the puncture of the needle. It is this: after freezing thoroughly over the space of a crown-piece, at the point where the puncture is to be made, place the point of the finger in the centre of the frozen part, and thaw at that point completely. When the skin at the spot under the finger is thus rendered quite yielding, the needle can be passed through it still painlessly, if the surrounding part be kept thoroughly frozen. I am indebted to Mr. W. Adams for this suggestion.—B. W. R.

ON FEIGNED HEMIPLEGIA.

BY ALEXANDER DAVIDSON, M.D., M.R.C.P.,
PHYSICIAN TO THE LIVERPOOL NORTHERN HOSPITAL;
AND
CHAUNCY PUZEY, L.R.C.P. LOND.

THE subject of feigned hemiplegia has been only very cursorily alluded to either in standard works of general medicine or in writings specially devoted to the consideration of feigned diseases. So far as we are aware, no detailed history of any such case has been recorded in medical literature, and we think that the following well-marked example will be both interesting and valuable.

Not long ago, we were requested to visit, on behalf of a railway company, and to report upon the case of a young man who was believed to be suffering from hemiplegia, the result of a railway accident. The history we received was as follows:—

Eight months previously, in a collision, he had received a blow on the left side of the body, which was stated to have been followed by hæmoptysis and the appearance of blood in the urine and motions. For this he was leeched, poulticed, &c., and remained under medical treatment for five weeks, when he was brought to Liverpool. At this time no symptoms existed of any injury to the brain or spinal cord; but two months after the accident, we were informed, he began to complain of pain in the dorsal region of the spine and of numbness of the left leg. He was kept in bed under medical observation; and one night, four months after the accident, he was found doubled up in bed, staring about, struggling and shouting. This attack was stated to have continued for seven hours, and he required several men to hold him still. Similar attacks recurred every night for a week following. After this the left leg became powerless, and weakness of the left arm was noticed; and the symptoms gradually increased until he appeared to have total loss of sensation and of motion on the left side.

We saw the patient in the presence of his medical attendants, and made the following report on his condition:—

We found the patient in bed, lying on his back. His countenance was rather pale, but did not exhibit signs of serious ill-health. The pulse was somewhat rapid, but regular and of fair strength. The body appeared well nourished. The heart, lungs, &c., were examined and found normal. There was no facial paralysis; the tongue was protruded normally, and articulation was perfect. Memory and intelligence appeared unimpaired, his answers to all questions being ready and sensible. The pupils were normal, and the vision appeared good. His own statement was that he suffered from headache, that his memory was not so good as formerly, and that his vision and hearing on the left side were somewhat impaired. In all these respects, however, he said that improvement had now begun. He admitted that he usually slept well, and said that he occupied a considerable portion of his time in reading. He exhibited signs of much tenderness when the lower dorsal vertebræ were touched, and complained of pain extending from that locality towards the left side; but he said he had no feeling in the skin all over that side of the trunk up to the clavicle, and pricking with a needle failed to elicit signs of pain. When raised in bed, he was able to sit erect with both his hands in front of him, and without assistance. The skin of the back was sound, and there were no bedsores. No paralysis of the bladder or rectum existed. We were told that the bowels acted three times a week, and that on those occasions he went to the closet outside his bedroom, with the assistance of one person.

On proceeding to examine his left leg, which was stated to be completely paralysed both with regard to motion and sensation, we found no difference in appearance between it and the right limb. The muscles on each side were equally firm and well developed, and the measurement of the two legs corresponded in every particular. He professed to be unable to move the left leg to the smallest extent, but when the leg was raised from the bed and bent backwards and forwards, distinct muscular contractions were felt by us. On applying a weak faradaic current, we found the electro-contractility of the muscles perfectly normal. On pricking different parts of the leg with a needle, no sensation appeared to be excited, and no reflex movements were caused by this or by tickling the sole of the foot. On one occasion, however, at a later period of the examination, when his leg was surreptitiously pricked under the bedclothes, his attention being drawn away by a feigned examination of his eyes, a decided jerk of that leg took place; at another time, when pricked unexpectedly on the inner side of the left buttock (as he lay upon his face), he flinched most decidedly; but after this was openly remarked on, and the pricking was repeated in the same spot, no movement occurred.

In order to observe his mode of progression, he was had out of bed by the aid of his brother. He then stood on his right leg, with the left leg slightly bent at the knee, the heel drawn up, and the toes scarcely touching the ground. He then proceeded towards the door, supported by his brother and holding on to the bed. With this help he made a series of steps with the right foot, and at each step we observed that the left leg was jerked up (by muscular action) just as occurs in hopping on one leg. The dragging of real paralysis was wanting. As he was getting into bed again the knee of the affected side was bent almost at a right angle, before it touched the bed.

The paralysis of the left arm was stated to be complete with regard to feeling, but incomplete as to movement. Both arms appeared equal as to size, muscular development, and temperature. On pricking the left arm with a needle, no pain was complained of, and no reflex movements were excited. On being asked to show to what extent he could move that arm, he raised the forearm slightly, but used the help of his right arm to raise it at the shoulder. The muscles contracted well under the faradaic current.

He was again seen by us after a lapse of three months. The general characters of his condition remained, with the following alterations. The left arm was stated to have recovered much of its sensibility, and the power of movement had partially returned. He was also able to move the toes of his left foot to a slight extent, and said he had some feeling in them. He still appeared to be unable to stand or walk. A marked difference, however, was noticed in his manner of progression from what we had previously observed. The heel of the left side was still slightly drawn up as he moved, but now the toes were dragged along the ground, the right knee being also slightly bent. The following circumstances were noted as he lay in bed. On attempting to

bend the knee while we elevated the leg, he at first forcibly resisted, the extensors of the thigh and leg being felt to be strongly in action; after a few seconds, however, they were suddenly relaxed. The skin of the thigh seemed to be as insensible as before, the patient even running a needle into different parts of it himself, to show how little he felt. When turned over on to his face he appeared to forget which was the affected side, for, seizing his *right* buttock and pinching it hard, he declared he felt nothing. On his mistake being referred to, he insisted that it was the other side which he had pinched. The impression left by his fingers, however, remained evident on the right buttock. The feet were clean, but the soles were dirty, as if used on the ground (though he stated that he had been absolutely confined to bed for some months). The skin of the soles was smooth and hard, and there was no appearance of that crackling or scaling of the cuticle which we see in the soles of adults who have been confined to bed for several months.

The conclusions which we arrived at as the result of these examinations were: That though some injury of the side had been received in the accident, its effects had entirely passed away; that no disease of the brain or spinal cord existed; and that the hemiplegic symptoms were feigned.

The case was tried in one of the law courts. The medical attendants of the patient and a physician (who saw him shortly before the trial) gave evidence that in their opinion the paralysis of the arm and leg was real, that it was due to injury of some of the nervous centres, and that the man was probably permanently disabled. In consequence of the difference between their medical opinion and ours, a further examination of the plaintiff was made during the trial, in the presence of another physician and a distinguished surgeon; and on this occasion some entirely new features appeared. For the first time, loss of sensation was complained of in the left side of the face, neck, and tongue, but without any dragging of the face or deviation of the tongue when protruded. The mode of progression was again different, the dragging of the leg being much more exaggerated than before, and the patient making no effort to support himself on the sound leg, but allowing himself to fall down if unsupported. It was also noticed that when the patient's eyes were closed the apparent line of insensibility, as tested by the needle, varied from a quarter of an inch to an inch to the *right* of the median line. The opinion given at the trial by the two gentlemen who had now seen the case for the first time was that it was a case of hysterical paralysis; but nothing had occurred in this third examination to shake our opinion. However, the jury gave a verdict for the plaintiff, with substantial damages.

Not very long after the trial he was seen by one of us walking about, apparently quite well, and, when spoken to, admitted that he was "nearly well, thank God."

To the medical practitioner in ordinary or in hospital practice such cases of feigned disease do not frequently occur; and when they do appear, he has usually ample opportunities for detecting and exposing the fallacy of the symptoms. And for this purpose there are three methods open to him. Firstly: The observation of the character of the symptoms, and the comparison of them with cases of undoubted disease. Secondly: Having the patient watched without his knowledge, so as to detect any movements or actions inconsistent with his supposed ailment. (This is of course best managed in a hospital.) Thirdly: The employment of violent or disagreeable methods of treatment, calculated to weary or disgust the patient; and even these may be resisted for a long time.

But it is different if the physician has not medical charge of the patient, but is called in under certain medico-legal circumstances, to form his opinion on observations made by him in one or two examinations. Then the first only of these methods is available to any extent; and it is only by a minute observation of the symptoms and general features of the case, and a careful comparison of these and of the statements of the patient with the known characters of real disease, that he can hope to arrive at a correct conclusion.

And in the first place, the general combination of symptoms, and their consistency with one another, should be considered.

In our case, the total anæsthesia of the left limbs and left half of the trunk, combined with the nearly complete paralysis of motion in the limbs of the same side (the face being unaffected), formed a group of symptoms which it would be extremely difficult, if not impossible, to explain on pathologico-anatomical grounds.

Secondly, the real nature of the defective sensibility must be tested.

It is well known that anæsthesia has often been feigned for various purposes. Numerous such cases have been recorded, especially by military surgeons, where much greater pain than the prick of a needle has been borne with the most unflinching resolution, and without showing the least sign of feeling.* In the instance just recorded it was evident, from the involuntary movements which were on one or two occasions caused by the unexpected application of a needle (when the man had not his muscles under control), that he really had tolerably acute sensibility. Where treatment by powerful shocks of electricity is available, it will usually be easy to cause such pain as will lead to the exposure of feigned anæsthesia.

Thirdly, the symptoms of motor paralysis must be carefully investigated; and if the paralysis is complete, or nearly so, it will not be difficult to distinguish between the real and the feigned disease.

Several tests are available. 1. The well-known appearance of dragging in a paralysed leg. This symptom was at first entirely absent in the above case; the slight dragging which was subsequently observed differed from that of ordinary paralysis. (See report.) 2. The test suggested by Dr. Hughlings Jackson. In real hemiplegia the paralysed arm falls forwards when the patient stoops; in a case of feigning, the arm will probably be retained by the side. (We omitted to use this test in our case.) 3. The condition of the muscles in long-continued paralysis. Where paralysis has continued for several months in a limb, we should expect that the muscles would both diminish in size and lose their electro-contractility. Neither of these conditions existed in our case. 4. In cases where the patient says that he has been confined to bed for many weeks, the condition of the soles of his feet may be taken as a test of the correctness of this statement. A scaly and cracked condition of the cuticle of the soles will, according to our experience, be invariably found in adults (at least in the lower ranks of life) who have been confined to bed for a considerable time.

In all cases of suspected feigning of disease we should endeavour to ascertain whether the patient has had opportunities of becoming acquainted with the symptoms of the disease supposed to be simulated. In our case we were informed that an acquaintance of this man, who was in the same accident, became actually hemiplegic within twenty-four hours after meeting with his injury, and that this fact was well known to the patient.

There are many other points contained in our report of this case which assisted us in arriving at our conclusions, but which we think it unnecessary to discuss at length.

Liverpool.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo nos endi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

LONDON HOSPITAL.

PARALYSIS OF HANDS AND FEET; PROGRESSIVE MUSCULAR ATROPHY; DISEASE OF SPINAL CORD.

(Under the care of Dr. RAMSKILL.)

THE following cases, for the notes of which we are indebted to Mr. R. Kershaw, are interesting examples of two varieties of progressive muscular atrophy. In the first case the muscular affection appears to be secondary to chronic disease of the spinal cord; whereas the second is an instance of the ordinary form of the disease.

T. R——, aged forty-three, has muscular atrophy and para-

* See Beck's Medical Jurisprudence.

lysis of his hands and feet. He can feebly close his hands, but the power of extension is almost completely lost. When the hands are turned palm downwards they drop below the level of the forearms; and, when asked to lift them up, he endeavours in vain to bring the backs of his hands to the level of his forearms. He can, however, bend the forearms on the arms with such force that it is evident there is no loss of power in the muscles of the upper part of the arms. The paralysis is in the flexors and extensors of the hands; and these muscles are especially wasted. The muscles of the balls of the thumbs and the interossei muscles are also affected. He can flex and extend his legs so forcibly that it is difficult to resist him; at the same time he cannot flex his feet. Owing to this diminished power over his feet, he throws them forward when walking, and they come down unsteadily as if held loosely. He does not bring the heels down in the abrupt manner seen in locomotor ataxy; but he seems to drop his feet to the ground. His muscles generally are badly nourished. This is well seen in the pectorals, the only exception being in the muscles of the back of the neck. Like a patient with locomotor ataxy, he cannot stand when his feet are close together and his eyes closed. This disease, he says, came on with pain. Four years ago he suffered with severe pains in all his limbs, of a shooting, aching character; his limbs pained him when he walked, and his medical attendant said it was rheumatism. His joints, however, were not swollen. The pain continued several weeks, then subsided, and he returned to his work. Twelve months afterwards the pain again returned, and he was laid up several weeks, and during the last attack of pain he observed that his hands felt numb, and he gradually lost the use of them, and their muscles wasted. Some months afterwards his feet became numb, and they, like his hands, gradually became paralysed. The pain has recurred more or less ever since.

Dr. Ramskill, in speaking of this patient, remarked that there was muscular atrophy, which at one time was evidently progressive, so that we might truly say that he has suffered from progressive muscular atrophy. It is to be observed also that the symptoms which occurred in the beginning of his illness, and which, so to speak, ushered it in, are unlike those noticed in ordinary cases of "progressive muscular atrophy," in which the primary change commences in the muscular fibres themselves. Pain followed by numbness and paralysis of hands, and subsequently of feet, are not symptoms characteristic of primary muscular atrophy. But similar symptoms have been seen where the spinal cord was diseased, and in such cases the hands and feet were paralysed as in this patient, and the extensor and flexor muscles of the hands and feet were more especially wasted. Post-mortem examinations of the cases here alluded to revealed that the upper part of the spinal cord was diseased, and seemingly it had been preceded by old spinal meningitis. Keeping in mind this experience, we are led to think that in this case also the membranes of the cord are probably thickened. At the time he had the first attack of severe pain, the so-called rheumatism, he probably had localised spinal meningitis, which has left fibroid thickening of membranes, and the growth has probably invaded the cord also. It is not surprising to find that the pain was considered to be rheumatic, for experience has shown that a patient with spinal cord disease may have arthritic disturbance which renders the diagnosis still more difficult. Pain, redness, tenderness, and swelling of the joints—in fact, arthritis resembling that of rheumatic fever, but perhaps more limited, may show itself in some diseases of the spinal cord. In this case, however, there does not seem to have been any actual arthritis. The patient has no paralysis of the bladder, but in other corresponding cases, with atrophy, where the cord was found by post-mortem examination to be diseased, the bladder remained for a long time unaffected. Dr. Ramskill further remarked that some years ago Sir W. Gull, in the Guy's Hospital Reports of 1848, pp. 194, 195, recorded a case in which there was muscular atrophy of the extensors of the hands, thumbs, and interossei. The wrists dropped, but the patient could carry his arms up to his head. There were also numbness and neuralgic pains, but in the left arm only, whereas in the present case there is pain in both arms. In Sir W. Gull's patient the legs were wasted and weak. The post-mortem examination showed increased vascularity, and thickening of the pia mater covering the posterior columns, and in them abundance of granular cells were discovered by the microscope. This exudation was greatest in the middle and lower third of the cervical enlargement. The grey matter was hyperæmic; no exudation into its tissue, and none into the anterior columns. The affection of the cord seemed to be secondary to chronic inflammation of the membranes.

In contrast with the case above given, it may be instructive for us to record the following one, in which the muscular atrophy is probably dependent primarily upon changes in the muscular fibres themselves, and not on spinal-cord disease; the disease being

PROGRESSIVE MUSCULAR ATROPHY.

J. B——, aged thirty-six, stated that about eleven years ago, when working in India, he had sunstroke, and was unconscious three days; then got well. Nine years ago he had jungle fever, and was laid up for three months. Then he remained well until the following year, when his present ailment began. At the onset his friends used to remark that his walk was peculiar, but he cannot describe what it was like at that time. Soon afterwards he noticed a sense of weakness on the inner side of his thighs; then his arms became weak, and he found that the muscles of his arms wasted, especially those between the shoulders and elbows. At that period he was able to run and walk, and do his work as usual, which was light; and he continued to work until two years ago.

On admission into the hospital he was still able to walk a short distance without difficulty, but only slowly, and was unable to run. He could stand with his eyes closed and his feet close together, but not well. He has never had any trouble in passing urine.

At the present time those parts of the pectoralis major attached to the clavicle are much wasted, but the sternal attachment is not so; in fact, the sternal portions look as if hypertrophied—this may be by contrast only. The accessorii spinæ are greatly wasted, especially in the dorsal region; but the posterior scapuli seem to be hypertrophied. The biceps and triceps are much wasted, also the external rotators of the femurs and the glutei.

LEEDS GENERAL INFIRMARY.

EMBOLISM OF A BRANCH OF THE CENTRAL ARTERY OF THE RETINA; PARALYSIS OF OUTER HALF OF THE RETINA; CONSTITUTIONAL SYPHILIS.

(Under the care of Mr. OGLESBY.)

DANIEL S——, aged twenty-nine, formerly a soldier in the 5th Dragoon Guards, but now an iron-moulder, on the 12th January, 1874, presented himself as an out-patient at Mr. Oglesby's table, complaining of loss of vision of the right eye, which had occurred suddenly three months before. He was evidently anæmic and in ill health, and he admitted without hesitation the fact that two years and a half previously he suffered from constitutional syphilis. He was discharged from the service fourteen months ago, consequent upon a fall from his horse, which rendered him subject to sudden fits of vertigo; but never during any of these attacks was vision interfered with. Latterly he has been ailing and out of spirits without (to him) any apparent reason, but certainly from blood-poisoning, as evidenced by the peculiar syphilitic markings on the skin of the legs which had lately shown themselves—characteristic copper-coloured patches dotted over the skin of each leg with a puckering of the cuticle, which produced an appearance of cicatrices, although the skin over no single spot had ulcerated. There was no disease of the heart. The urine on examination was found normal. On mapping the field of vision, it was found that the outer half of the retina was paralysed. The ophthalmoscope disclosed an anæmic condition of the disc, with a filmy (œdematous?) condition of the retina around its outer margin; the retinal vessels distributed to the paralysed half of the retina were so small that they could but with difficulty be found; the yellow spot appeared healthy, and no blood extravasations were visible. The vessels distributed to the healthy side were diminished in calibre, although arterial pulsation could easily be produced on pressure. This was not so on the diseased side, although the vessels were so small that pulsation so produced might have escaped the most minute

observations. The interruption of the blood-current so often seen in these cases did not occur. At one point a small coagulum was discernible, but with this exception no irregularity of the blood-flow occurred, nor were any of the small arteries white in outline, which sometimes occurs from lymph streaks following in their course.

The man was at once admitted as an in-patient for further observation. It was then discovered that he suffered from terrible cerebral neuralgia, which occurred in paroxysms after retiring to rest. Here, again, syphilis showed itself. Ten-grain doses of the iodide of potassium administered thrice daily proved of service, and the cerebral attacks became less frequent and less painful. On further testing vision, the central part of the retina was found to be but little affected. A few days after admission the disc became grey, hazy, and indistinct, as if from effusion, and this filmy condition gradually extended to the retina bounding the inner margin of the disc; this was followed by a diminution in the calibre of the vessels supplying the inner half of the retina, and ultimately paralysis resulted. Still a fair amount of central vision remained, but the field was exceedingly limited in extent. Then resulted a decided neuro-retinitis, which was well marked. After this the patient decidedly picked up in condition, lost his anæmic look, improved in appetite, and expressed himself as feeling, comparatively speaking, well. After the lapse of a week the effusion began to disappear, and the margin of the disc became more distinct, but still the peripheral portion of the retina showed no sign of returning health.

On Jan. 21st, the notes of the case say: "The vessels supplying the outer half of the retina are carrying more blood; there is now slight disturbance of the vitreous humour. On comparing the diseased with the healthy disc, it was found that the left disc appeared in every respect healthy, the vessels being of average size, and carrying a normal quantity of blood."

The yellow spot and its surroundings were frequently examined to ascertain if any effusion existed, or if there were minute blood extravasations, but its appearance never varied from that of health, as, indeed, might be expected from the fact of central vision being so good. Then a considerable time elapsed before any fresh symptoms occurred. On February 3rd vision began to improve, and the patient wished to leave the hospital, saying he felt much better in general health. It was now observed that the circulation in the retinal vessels was becoming more normal, but pressure on the vessels supplying the outer half of the retina produced no pulsation indicating that the clot was not all absorbed. Pressure still produced a modified degree of pulsation in the vessels supplying the inner half. It was suggested by Mr. Oglesby that the sudden paralysis of the inner half of the retina was probably due to the clot which blocked up the vessel to the outer half having become partly free, and so carried by the circulation into the adjoining vessel distributed to the opposite side.

The iodide of potassium was of great service in improving the general health, and was continued during his stay in hospital. Mr. Oglesby proposes, in the event of the man returning for further treatment, to put him through a gentle mercurial course.

MAISON MUNICIPALE, PARIS.

CASE OF GENERAL ARTICULAR RHEUMATISM RAPIDLY CURED BY PROPYLAMIN.

(Under the care of Dr. FÉRÉOL.)

THE patient, aged twenty-four, was suffering from a third attack of rheumatism. The first attack had occurred in 1869. Heart complications ensued, and were treated by means of the cupping-glass and scarificator and blisters. The rheumatic pains in the joints lasted three weeks. The patient was then sent to Aix to get the benefit of the waters. During the two following years he was free from rheumatism. A second attack then occurred. The pains lasted about two months, and slowly disappeared. The heart was again involved.

The third attack began on December 28th, 1873, with pain in the ankles, slowly extending to the larger joints. On January 2nd the pains were most intense, and heart symptoms were stated (rubbing, bruit de souffle, &c.); pulse 104; temperature 38° Cent.; thirst, anorexia, constipation, &c. Fifteen grains of propylamin to be administered.

Jan. 3rd.—Same state; no improvement. Twenty grains of propylamin ordered.

4th.—The condition of the heart has much improved under the influence of a blister; much less pain. Twenty-five grains of propylamin ordered.

5th.—Great improvement; the patient asks for food; can move his limbs; pulse less frequent.

6th.—Patient declares that the pains suddenly left him yesterday afternoon; walks about in the wards. Pulse and temperature normal. Treatment left off.

The rapid effects of this plan of treatment are especially important when compared with the two former attacks.

Medical Societies.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

TUESDAY, MARCH 24TH, 1874.

DR. C. J. B. WILLIAMS, F.R.S., PRESIDENT, IN THE CHAIR.

ON AN IMPROVED METHOD OF ABSCISSION OF THE ANTERIOR PORTION OF THE EYEBALL.

BY ROBERT BRUDENELL CARTER, F.R.C.S.,
OPHTHALMIC SURGEON AND LECTURER ON OPHTHALMIC SURGERY AT ST. GEORGE'S HOSPITAL.

AFTER mentioning the conditions that call for abscission of the anterior portion of the eyeball, and the way in which the operation once practised was improved by Mr. Critchett, the author relates a case in which Critchett's operation was followed by sympathetic ophthalmia and loss of sight. He attributes this result either to traction upon the ciliary nerves in the cicatrix, or to laceration of one of them by one of the needles used to transfix the eye. In order to set aside these dangers, and at the same time to obtain a stump well calculated to carry an artificial eye, he has devised a plan of operating which is described. It consists of uniting the tendons of the recti muscles by catgut sutures, and then of uniting the conjunctival wound over them, no sutures being passed through the ocular tunics themselves. A patient who had been operated upon in this manner was exhibited to the Society.

Mr. HIGGINS said the usual plan at Guy's Hospital was to cut out the anterior portion of the eyeball, and then bring the conjunctival edge together; and they found this a better plan.

Mr. BRUDENELL CARTER had had no experience of this, and did not think it would give so good a stump as that formed by the tendons, &c.

RECENT EXPERIENCE OF CHOLERA IN INDIA.

BY JAS. MACKAY CUNINGHAM, M.D.,
SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA.

After some introductory observations on the importance of the cholera question, especially at the present time, Dr. Cuningham proceeded to remark on the special opportunities afforded by India for the study of cholera, and the great value of the information to be obtained there. He then entered into an examination of the evidence derived from the history of the epidemic of 1872 in Northern India. Two great points had to be determined—first, the influence of human intercourse in spreading the disease; and, secondly, the practical measures to be adopted for protection.

1. The evidence as regards human intercourse was considered with reference to the geographical distribution of cholera in India; the great areas of prevalence and exemption; the experience of the same tract in different epidemics; the endemic area, the seasonal and periodic rise and fall of cholera within this area; and the singular immunity of certain places. Further, with reference to this question, Dr. Cuningham dwelt upon the detailed evidence afforded by the history of 100 outbreaks in 1872. There was an entire absence of all evidence of communication of the disease, and the previous considerations were fatal, Dr. Cuningham believed, to this doctrine. The epidemic was not propagated along highways of communication, and did not travel any quicker in these days of railways than it did in olden times. Singular evidence against the contagiousness

of the disease was derived from the St. Peter's College outbreak, many cases having been sent thence into various localities without, in one single instance, disseminating the disease. The experience of attendants on the sick was against all suggestion of contagion, a small proportion of those only being attacked, and there was an absence of all evidence of contagion in regard to those who were attacked. As to indirect contagion, the facts bearing on the water theory, as illustrated by the outbreak at Peshawur and Mean Meer and other places, were wholly against its accuracy. Dr. Cuningham dwelt on the importance of local conditions in connexion with the singular localisation of the disease, as illustrated by the outbreaks at St. Peter's College, and amongst the troops at Kussoulie, in the camps at Mean Meer, &c.; and he urged the necessity for studying these local conditions much more closely. The incidence of the outbreak as regards time among different sections of the community next received attention.

2. In considering the practical measures to be adopted to afford protection from cholera, the impossibility of carrying out an efficient quarantine was considered, and the great evils attending any attempt at it shown by the experience of Upper India on this point. The primary importance of sanitary improvements was next urged, and a strong opinion was expressed on the tendency of the contagion views to interfere with progress in this respect.

Dr. HARDIE said he had had some experience of cholera in Mauritius during two epidemics, and in both cases it had been imported into the island by the ships bringing over coolies from Calcutta. In a previous epidemic it was introduced in the same way, through the quarantine rules being broken, so that the cholera had each time entered by the only port of the island. He did not think India was a good place to experiment upon cholera. In the epidemics he had seen if there was a cause of immunity he thought it was on the estates where the people were supplied with water from wells. He thought the water-streams were the great cause of its spread.

Sir WILLIAM GULL said he had gone over the whole story of cholera some years ago. He was interested to find in the paper that fresh statements added nothing to what Dr. Baly had already said. He thought it was to be regretted that the report of the Royal College of Physicians was so little known and referred to. The whole question of diffusion by water, human excreta, and of sporadic cases had been gone into. Occasionally water was a means of diffusion. When a ship was said to bring contagion to a place it should be remembered that a ship is a locality. The late Dr. Addison, speaking to him of the contagiousness of cholera, said, with regard to the admission of a patient with cholera into Guy's, that if you bring in a man from Tooley-street with it you bring in the locality, and so cholera. During the last epidemic a cholera hospital was established at Whitechapel, under the care of Dr. Sutton. The disease never spread to the nurses or the attendants, and he thought for this reason: as soon as a patient entered, his clothes were taken away, the patient sponged with Condy's fluid, and the hair cut; and this regulation he had helped to enforce lest the locality as well should be brought in by the patient. He did not believe in the evidence of the contagiousness of cholera. He thought the statement that it was spread by the evacuations was a good working theory, as it acted by frightening people, but proof of it as a scientific fact was wanting, and he would be glad to learn it. If this was one cause there were others. He believed it always came by ship, but sporadic cases were always met with before an outbreak. He referred to the outbreak of Asiatic cholera in Mr. Druit's farm in Surrey for poor children in the epidemic of 1848. About half of the children died, and it was at first supposed that their deaths had been hastened by bad food, poison, &c., and Mr. Druit died broken-hearted on account of the way he was judged by public opinion. After a time it was clearly seen that it was the beginning of the outbreak. And often isolated cases, not traceable to human intercourse, have preceded outbreaks. At present there was no scientific theory of the spread by contagion and evacuations. It was singular how heights above the sea-level had to do with the origin of cholera. Cholera did not descend streams, but ascended them. This was a fixed and certain law. As to sanitary improvements, there were two views, but only one mentioned in the paper. Sanitary improvement fortified the body against epidemics by means of good air, ventilation, and cleanliness; then it removed telluric influences, as damp, dirt, &c., and so improved the health of the people.

Dr. BUCHANAN hoped Sir W. Gull would retract the expression that the water theory was useful though false; he would be sorry to advance a water theory if he thought it false. (Sir W. Gull then said he would say, an imperfect one.) He thought the remarks made about cholera in the first part of the paper were equally applicable to fever, and not alone to typhoid, but he would say even for typhus fever every assertion would hold good. He was sorry to hear many assertions which had been put forth about personal contagion. When Dr. Cuningham said he looked to India for evidence, and did not consider that brought forward in England, he would ask him to look afresh at our evidence. He did not think the circumstances in India were favourable for the investigation of cholera. If we wished to study measles or scarlet fever, would we go to a large place like London, or to a remote village, or to a place where its introduction is easily ascertained? Could outbreaks of yellow fever be as well worked out in the West Indies as the outbreak at Swansea was? It was from these out-of-the-way cases that we learn. With regard to the arrest of cholera, he thought by preventing filth being out of its place we did a great deal, as the poison is associated with excrementitious matter. He regarded atmospheric influence and telluric influence as mere words, and inoperative as causes.

Mr. NETTEN RADCLIFFE stated that he should have had some hesitation in taking part in the discussion, but, looking at the clock, he had begun to fear lest the discussion should come to an end without more definite reference having been made to the kind of facts upon which Dr. Cuningham had founded his opinions. Now, so far as the two points most prominently raised in the paper were concerned—those relating to the contagiousness of cholera, and the so-called water theory,—Dr. Cuningham's views were founded on fallacies. The "contagion" of which he spoke was not the "contagion" understood in this country; the "water theory" had hardly the faintest resemblance to what was meant here by the term. Dr. Cuningham judged of the contagion of cholera as if it were operative in the same way as the contagion of small-pox, and were, moreover, some self-operative agency acting irrespective of conditions. Such a doctrine of the contagiousness of cholera had no place in English teaching, so far as Mr. Radcliffe was aware. The very characteristic of etiological study in this country for many years, in respect to contagious diseases, had been, and still was, the determination of the conditions under which the particular contagions of the several diseases operated. Even small-pox was no exception to this study, and some of the most instructive data were furnished by inoculation. To argue that because the contagion of a disease did not operate unconditionally therefore contagion did not exist, was much the same thing as to argue against the germinative power potentially present in a potato or a grain of wheat because germination did not occur and growth follow except the potato or the grain of wheat were placed in certain well-understood conditions. The whole of Dr. Cuningham's inquiries as to the contagion of cholera had been governed by notions of this kind, and a perusal of the data he gave would prove that the results of the inquiry as to contagion were valueless to English research. Again, as to the water theory—the theory which had been broached here, and was used to explain certain facts of localisation alone. Dr. Cuningham spoke of the theory as inconsistent with the geographical distribution of the disease, as being negatived by the fact that bodies of troops widely separated from each other, and drinking from different sources of water, had been nevertheless severely attacked with cholera, and so forth. Such arguments proved that Dr. Cuningham was not dealing with the water theory understood here, but with something far different, and which had nothing in common with English notions. Even in one particular instance—the St. Peter's College, Agra—where an outbreak had occurred which would have led most English inquirers to make minute investigation into the sources of the water-supply, such inquiry, so far as the detailed report permitted a judgment to be made, had missed the very point to be inquired about. Mr. Radcliffe regretted that the time at the disposal of the meeting prevented him from illustrating the remarks he had made from

point to point in Dr. Cuningham's report. He referred briefly to Dr. Cuningham's observations as to the absence of any evidence in India that a quickened traffic had accelerated the movements of cholera, and pointed out that the data given by Dr. Cuningham did not contain the materials for a judgment. He asked, also, whether, if it were true in the comparatively narrow field of diffusion to which the data referred, they would set aside the facts obtained from the study of the great migrations of 1832, 1848, and 1865, in which, for example, the question of time of carriage from East Europe to America was a simple matter of observation. The first cargo of cholera carried to America in 1832 was carried in a sailing ship; the first cargo carried in 1866 was carried in a quick-sailing steamer. Dr. Cuningham maintained that the recent experience of India demonstrated the inaccuracy of the views now commonly entertained in this country as to the diffusion of cholera. He had illustrated, with respect to the water theory, particularly the outbreaks of cholera in Broad-street and East London. Mr. Radcliffe contrasted the circumstantial character of the inquiry into the two outbreaks referred to with the inquiries instituted by Dr. Cuningham, and concluded by saying that inquiries which were held to set aside the results of the English inquiries should produce evidence of having been conducted with an equal degree of minuteness.

Dr. FAYRER did not think that Dr. Cuningham had shown in anything a desire to underrate English labour. He was surprised to hear that India was not the place to study cholera. Dr. Cuningham had not dealt with opinions, but had mentioned facts. He believed cholera was due to some "influence," not a poison. With regard to contagion, he thought there was as much evidence to prove it as there was against it.

Dr. BURDON-SANDERSON said that Dr. Cuningham had come before them not bringing forward theories, but only stating facts. He did not agree with Dr. Buchanan that India was not the place to investigate cholera; for as to the question of etiology, it was better to proceed by the law of exceptions; but then cholera was so widely spread that its existence in a place was not an exception, so it was difficult to apply the rule. But Dr. Cuningham rested on the immunity of places; that was the exception. So those who asserted that personal communication was the cause influencing the spread of cholera in India, and those who maintained cholera spread up a stream, and got down by contaminating the water, both had to contend with the absence of cholera in places. He thought cholera was a disease of local origin, and, to go further, it attached itself to organic matter in a state of decomposition. That was the opinion Pettenkofer contended for, though obtained from a different source, and as expressed by Dr. Cuningham from the results of his observations in India.

Dr. CUNINGHAM, in reply, said that with regard to the etiology of cholera in India, there was an area in Lower Bengal where cholera was constantly present, and there were rises and falls of the disease, and beyond that area there were isolated cases, and epidemics prevailed. The supporters of contagion should take up these facts and grapple with them. As to Dr. Hardie's epidemics, supposed to be due to human intercourse, we had only to put against it that emigrants had gone from Calcutta to Mauritius for many years, and cholera was always present at Calcutta, and yet the epidemics Dr. Hardie spoke of were the only ones which had occurred. Because a ship arrived and cholera became epidemic over the island, should that be set down as the cause? The history of cholera in India was that it ascended streams, and did not descend them. The work of Sir W. Gull and Dr. Baly was well known in India, but he thought it was very little known in England. He thought that there was little more known of cholera here than there was twenty-five years ago. The doctrine of contagion was not a harmless one; he thought it a bad working theory as not being truthful; all that was said of the water theory showed that we had no evidence in support of it. Dr. Buchanan said the same arguments would apply to fever. But what if they did? The facts as to small-pox were as inapplicable as those of cholera. Then he said the circumstances in India were not favourable for the study of the disease; but he (Dr. Cuningham) thought that it was quite as easy to do this in India as in England, and that was no reason upon which to set aside the evidence. As to the meaning of the words contagion and water theory—whether the water theory was the means of contagion, usually or rarely, was a matter of unimportance; the great question was, was there evidence of a single case in India or England that cholera spread by the evacuations of cholera patients? Anyone in India who had studied the question would throw aside the "Broad-street pump" evidence as valueless. The evidence he had brought forward with regard to the outbreak of cholera was as good as any evidence for any outbreak of cholera, or any other disease. Twelve or fifteen compounds had been attacked on or about the same day, and the people drew their water from different sources. With regard to the diffusion of cholera to-day as compared with that of former days, and depending upon the increased facility of communication, and that epidemics were gradually accelerating their rate of advance, he would only state that in 1817 a wave of cholera passed over India, and it took about seven months, in 1870 another wave passed over India, and it took three years, to travel from and to the same points, though the means of traffic by rail, good roads, &c., were multiplied manifold. With regard to the outbreak of cholera at St. Peter's School, Agra, it had been said that the whole thing was slurred over, and the evidence untrustworthy, and that it was due to contaminated water, which was used though it had been prohibited. He would only state that, of twenty-four day-scholars who drank the same water, all escaped except one, and he was the only one who resided in the same enclosure. Here, he thought, no water theory could be employed to explain the circumstances.

MEDICAL SOCIETY OF LONDON.

MONDAY, MARCH 2ND, 1874.

DR. S. O. HABERSHON, F.R.C.P., PRESIDENT, IN THE CHAIR.

MR. FRANCIS MASON showed four Polypi removed from the nostril of a boy aged twelve, at one operation. The largest was horseshoe-shaped, measuring two inches by one inch and a half; the next in size was two inches long and one inch wide, and resembled a large slug. Both these were removed by evulsion with the ordinary polypus forceps, through the fauces and mouth. The remaining tumours were flattened out, elongated, and measured nearly two inches. They lay in the cavity of the nostril and could be seen from the front, and were taken away with the forceps through the anterior nares. The pedicle of each polypus was extremely delicate. Mr. Mason spoke of the facility with which the operation was performed, and thought there was much less danger in adopting this method of removing polypi passing into the pharynx than is generally supposed. The application of a ligature to such tumours was a troublesome proceeding, and was really necessary in but few cases. He believed that severe hæmorrhage rarely accompanied the removal of the polypus; the bleeding was in most cases due to the attempt made by the operator to clear the nostril completely of the morbid growth, in doing which the mucous membrane was unavoidably injured. The tumours had existed as long as the boy could remember. There was but little hæmorrhage in this case, which was no doubt due to the slender attachments of the growth.

Mr. DE MÉRIC referred to the use of "Hilton's snare" in these cases, and spoke of the practice of slitting up the velum, and the necessity in some extreme cases of even removing the superior maxillary bone, in order to enable the operator to reach the base of the tumour.

Dr. PROSSER JAMES concurred in the opinion that there was little or no danger in removing polypi of this kind when the attachment was not broad; for cases thus manageable he deprecated the more grave operation mentioned by Mr. de Méric. That was only to be resorted to in very different cases, where neither ligature, forceps, nor écraseur could be applied. He was surprised to hear no mention made of the rhinoscope. Without ignoring the *tactus eruditus*, he thought it less certain than vision, and by the aid of the mirror a diagnosis could be formed at a much earlier period. True, in such a case as Mr. Mason's, the size of the growth would block up the passages, and it might be difficult to determine the extent of attachment; but the rhinoscope would enable the observer to see a polypus long before it attained such dimensions, when it was, in fact, very small. It would also enable us to remove polypi, by properly-shaped instruments, or to employ what was some-

times a successful mode of treatment—the application of local remedies. He would like to ask Mr. Mason whether he had taken any preventive measures against recurrence. It was well known that these polypi were likely to return, and he (Dr. James) believed that rhinoscopical medication was of considerable service in preventing this. Guided by the rhinoscope we could apply solid or fluid substances to the root of the pedicle after evulsion, and even the nasal douche. Insufflation of powders, and the use of properly constructed atomisers, were valuable additional agents. Such methods might, indeed, sometimes supersede the necessity for operations, when the polypi had been detected while yet small.

Mr. HENRY SMITH showed a very fine specimen of an Enchondromatous Testicle. At the operation the cord had been clamped, and the actual cautery applied. The patient progressed favourably till the eighth day, when he complained of pain in his side. He did not have any shivering, but obstinate vomiting set in, and he died. At the autopsy the wound looked fairly healthy; there was no peritonitis. The diaphragmatic pleura was studded with lymph.

Messrs. de Méric, Bell, and Hainworth took part in the discussion which followed.

Mr. ROYES BELL then related some cases which had been successfully treated with the aspirator.

Mr. DURHAM showed some foreign bodies which he had removed from the urethra.

Mr. HENRY SMITH mentioned the particulars of a case in which he had removed a piece of tobacco-pipe from the bladder by lithotrity, and a few months afterwards he was called on to extract a small button-hole flower tube, with a piece of string attached, from the urethra of the same patient (a young man).

Mr. CROFT spoke of a new instrument he had designed for the purpose of removing foreign bodies from the urethra. The blades of the forceps were fenestrated, and opened parallel to each other.

Mr. BRUDENELL CARTER related how a patient had broken a piece of bougie two inches long in his urethra, and he described the means he had adopted for its successful removal.

Reviews and Notices of Books.

Lessons in Hygiene and Surgery from the Franco-Prussian War. By CHARLES ALEXANDER GORDON, M.D., C.B., Deputy Inspector of Hospitals, late on Special Service to the French Army, &c. pp. 263. London: Baillière, Tindall, and Cox. 1873.

Les Ambulances de la Presse annexés du Ministère de la Guerre pendant le Siége et sous la Commune 1870-1871. MARC, Editeur. Paris: Baillière et Fils. 1873.

IN the war which recently spread darkness and dismay over the face of Europe the members of our profession had an interest purer, higher, and nobler than the envious or selfish concerns of the equalisation of power or the extension of territory. No sooner had war been declared between the French and the German nations, than the medical men of all countries and political creeds voluntarily combined as one body to devote themselves to the relief of the distress and the suffering of their afflicted fellow-creatures. The results of this professional co-operation and philanthropy have been more or less accurately detailed in the works now before us. But we cannot fail to see that, great as was the amount of good accomplished, much was left undone; or, what is worse, was unsuccessfully attempted. Many lives which had been spared by the ruthless hand of war, or, at most, had been only jeopardised thereby, were unquestionably sacrificed to diseases which, under quite perfect hygienic conditions, are accounted preventable. Typhus and typhoid fever, pyæmia and hospital gangrene, were, in certain localities, frightfully prevalent, and in some of the hospitals attained such a degree of virulence and malignity as to necessitate the closure of the institutions for an indefinite period of time. The "lessons" which Dr. Gordon has drawn up, imperfect and unsatisfactory as in many particulars they are, furnish us with much material for reflection on the causes of the want of entire success in the medical departments during the Franco-German War. In the French army, for instance, the medical officer in the field and in the ambulance was, even in professional matters, under the absolute control of the commanding officer or other lay officials. Even in the German army the medical officer was not treated with the respect and dignity becoming the importance of his office, or the danger of his duties. On these matters Dr. Gordon has expressed himself with some force and feeling, and, as long as he confines himself to the soldier or his surgeon, our author is interesting, if not original. But in the subsequent chapters, in which he deals with questions of practical surgery and hygiene, he is more meagre and unsatisfactory. In these chapters nothing has been added to what we already possessed, except, perhaps, a few referential notices to some of the more recent works which had their origin in the experiences of the late war. The work is, nevertheless, not without merits, and may be read with profit.

Although the work which has been published by the Society of the Press is not professedly of a strictly scientific or medical nature, it nevertheless contains a large element of both, and will be found of interest not only to those who were concerned in the laudable charitable efforts that were made to reduce the misery and suffering produced by the war, but also to medical readers, and perhaps to these chiefly. Of the nature of the work performed by the medical department of the ambulance, under the able supervision of MM. Ricord and Demarquay, our readers may judge from the fact that during the war with Germany 15,022 sick and wounded were treated, and 1924 during the social war under the Commune, and that the number of sick and those suffering from fevers gathered into five of the larger ambulances amounted to nearly 25,000 before the end of the war. The administration of the *matériel* and *personnel* of the fixed and movable ambulances (of the former of which there were twenty-one) is dwelt upon in detail at some length. In the second or scientific part of the work many interesting facts are given concerning the use of disinfectants and antiseptics, and the dressing of wounds. There are also numerous illustrations of the various apparatus employed in the treatment of fractures and gunshot wounds. The article on Ventilation by General Morin is a very able one, and deserving of a careful perusal. As a history of the privations and the sufferings which the French endured during the war with Germany and during the siege of Paris, and as a memorial to unexampled philanthropy and benevolence, to which the members of our profession contributed no mean share, the report of the "Ambulances de la Presse" will be found instructive and interesting.

Man and Apes, &c. By ST. GEORGE MIVART, F.R.S. London: Robert Hardwicke. 1873.

THIS little work is divided into two parts: the first being devoted to the classification and zoological characters of the various genera and species of the ape family; and the second to an account of the resemblance which the external and internal skeleton and the soft parts bear to the corresponding parts in man.

Mr. Mivart's facts and arguments support the statement long ago made by Schroeder van der Kolk, "that the lines of affinity existing between different primates construct a network rather than a ladder"; and he maintains that if man and the orang are diverging descendants of a creature with certain cerebral characters, then "that remote ancestor must also have had the wrist of the chimpanzee, the voice of a long-armed ape, the blade-bone of the gorilla,

the chin of the siamang, the skull-dome of an American ape, the ischium of a slender loris, the whiskers and beard of a saki, the liver and stomach of the gibbon," and a number of other characters in which the several forms of higher or lower primates respectively approximate to man. But to assert this, he continues, is as much as to say that low down in the scale of the primates was an ancestral form so like man that it might well be called an homunculus, and we have the virtual pre-existence of man's body supposed, in order to account for the actual first appearance of that body as we know it—a supposition manifestly absurd if put forward as an explanation.

Mr. Mivart has expressed himself in previous publications so strongly against Darwin's theory of evolution, that it is with some surprise we find him in the latter part of this work contending that "an innate law has been imposed upon nature by which new and definite species, under definite conditions, emerge from a latent and potential being into active and manifest existence," which he conceives would represent a true process of evolution or unfolding, but which seems to us to be quite as difficult to conceive as the more gradual process of evolution insisted on by Darwin.

The book contains a large number of illustrations of the different species of ape and of the particular bones referred to, which, though somewhat roughly drawn, are sufficiently characteristic.

OUR LIBRARY TABLE.

What is Wine? An Inquiry suggested by the recent Correspondence in *The Times* on the alleged Adulteration of Sherry. By JAMES L. DENMAN.—Mr. Denman's endeavours to direct the taste of the wine-bibbing public to the Greek wines are well known, and, if only for their earnestness and persistency, deserve some measure of success. Although the present pamphlet is something in the nature of a trade circular, it contains some practical observations which show that Mr. Denman has devoted much attention to the subject of pure wines. To those who have an exaggerated sense of classical associations there must be something refreshing in the very idea of drinking wines from the "Isles of Greece" at 20*s.* a dozen, while the quotation of "Nousa," from Mount Oiympus, at 24*s.* a dozen, must appear to many a scholar like a free gift of the choicest Falernian. Now that Greece has a tolerably settled Government, it is quite possible that, although sunk from her former high estate, she may yet play a prominent part in supplying Europe with light wines.

Cheerful Words. Sermons specially adapted for delivery before Inmates of Lunatic Asylums, Unions, Workhouses, Gaols, and other Public Institutions. Edited by WILLIAM HYSLOP. London: Baillière, Tindall, and Cox. 1874.—The proprietor of Stretton House private asylum has co-operated with certain Church dignitaries and clergymen in putting together a series of sermons—plain in style, practical in inculcation, and cheering in tone. Each discourse can be delivered with ease in fifteen minutes—a consideration of importance in the case of audiences many of whom cannot sustain attention for more than a short time. For the purpose they are specially designed to serve they seem well adapted, and reflect no little credit on the good taste, sound judgment, and literary accomplishment of their editor.

The Practitioner. April, 1874. London: Macmillan.—The April number of this periodical contains several interesting papers, among which we may mention the following:—"Studies on Ether and Chloroform from Prof. Schiff's Physiological Laboratory," by Dr. T. G. Hake; "Spasmodic Asthma," by Dr. J. H. Webster; and "Observations on the Use and Effects produced by the Employment of Cold in Typhus and its Varieties," by Dr. Allvey—a posthumous paper. In the editorial part of the journal will be found an article on the "Collapse of the Sanitary Organisations under the Public Health Act, 1872," and one on the "Ventilation of Schools."

Un Philosophe sous les Toits. Par EMILE SOUVESTRE. With Copious Notes, for the use of English Students, by LÉONCE STIÈVENARD, French Master in the City of London School. Longmans, 1874.—The "Attic Philosopher in Paris," as the title of M. E. Souvestre's little classic has been cleverly rendered, is exceedingly well adapted for the purpose M. Stièvenard applies it to—a model of French style from which to acquire a knowledge of the language. The notes are abundant—perhaps too much so for independent study on the pupil's part,—and leave no difficulty unexplained. Their value, however, would have been greatly enhanced had M. Stièvenard introduced a little of that philological illustration so well supplied in the books of M. Brachet in the Clarendon Press series. The development of French from the Latin exemplifies so clearly the fundamental principles of comparative philology that no teacher of French in a classical school should miss the opportunity of initiating his pupils in that fine science. M. Stièvenard, by the way, would inspire more confidence in his ability to perform this part if he avoided such blunders as rendering the Pope's benediction "Urbi et orbi" "*in* the city and *in* the world"!

The Posthumous Papers of the Pickwick Club. By CHARLES DICKENS. With fifty-seven Illustrations by Phiz. London: Chapman and Hall. 1874.—The last instalment of the "Household Edition" of the Pickwick Papers is chiefly notable for the illustrations, from which the reader will turn with a melancholy feeling. "Phiz," once the faithful and spirited interpreter of Dickens, is now the shadow of his former self, his attempts at the finer delineations being conspicuous for their feebleness, and his broader touches for their vulgarity. As to the form of publication, we have a rooted objection to double columns and to the quarto size. But in what guise will Dickens cease to be popular? We doubt not that this edition will have numerous purchasers.

On the Drainage of Glasgow, with Special Reference to the Disinfection of Sewage, Ventilation of Sewers, and Trapping of House Drains. By JOHN HONEYMAN, Architect. Glasgow: Macnab, Miller-street. 1873.—The author advocates a continuous system of flushing, an effective ventilation of sewers, and the use of charcoal air-filters. As regards the water-supply for flushing purposes, he suggests that it might be taken from the river at a point so far up as to allow it to flow constantly down by gravitation, so as to admit of its being applied to all the sewers at a level say of 60 ft. above high water at Glasgow bridge. For trapping and ventilation the author directs attention to a design of his own to combine this double purpose.

On the Various Forces of Nature, and their Relation to each other. A Course of Lectures delivered before a juvenile audience at the Royal Institution. By MICHAEL FARADAY, D.C.L., F.R.S. Edited by WILLIAM CROOKES, F.R.S. London: Chatto and Windus.—These lectures are charming specimens of that simple, direct style of teaching by progressive lessons and experiments which made Faraday such a favourite lecturer with young people. There is nothing strained or affected about them; they possess the homely, pleasant style of a man who must have kindled the enthusiasm of his audience by the light of his genius and the ardour of his love of knowledge.

The Science and Art of Nursing the Sick. By ÆNEAS MUNRO, M.D. &c. Glasgow: James Maclehose, Publisher to the University. 1873.—A good and useful guide, especially to those who know little or nothing of the art of nursing the sick. The volume contains, moreover, a number of practical points and recipes, that much increase its value.

THE LANCET.

LONDON: SATURDAY, APRIL 4, 1874.

THE discussion on Cholera at the Medical and Chirurgical Society on the 24th ult. had a different interest from that which took place at the Epidemiological Society a few weeks previously. In both cases the Sanitary Commissioner with the Government of India, Dr. CUNINGHAM, was the central figure; but at the Epidemiological Society he was in opposition with certain Indian opinions and experience, while at the Medical and Chirurgical Society he was in opposition with current English opinions and experience. Indeed, in the later discussion, Dr. CUNINGHAM, applying his recent Indian investigations to European conceptions of the etiology of cholera, condemned the latter unsparingly, and in condemning them he condemned also the whole doctrine of contagion as applied to epidemic diseases. Dr. HARDIE objected that Dr. CUNINGHAM's experience did not cover all Indian experience on the subject, and that it was inconsistent with some; but Dr. CUNINGHAM swept the whole asserted Indian experience contrary to his own into the same category in which he had placed English experience. Dr. BUCHANAN suggested difficulties with regard to typhus and scarlet fever from the condemnation, but Dr. CUNINGHAM flipped the difficulties airily away. Sir WM. GULL thought the English theory of the conditions under which cholera spread a good "working theory"; but Dr. CUNINGHAM would have nothing of working theories, and the very word "theory" seemed to be obnoxious to him. Mr. NETTEN RADCLIFFE innocently strove to save something from the wreck, and craved for English medicine the merit of at least good intentions during the past quarter of a century; but this also was disallowed, and Dr. CUNINGHAM even extended the period over which English physic had gone about wandering after its own inventions. And so in the end Dr. CUNINGHAM stood alone among the ruins he had created, and loomed before the mental vision of the audience like GAVARNI's cynical philosopher, who, sitting upon the dome of the Invalides, contemplates the world beneath him through a reversed telescope.

It is not easy to treat seriously the position claimed by Dr. CUNINGHAM for his researches in India, and particularly for the observations made by him and his coadjutors during the cholera epidemic of 1872. The conception that an inquiry carried out as the latter inquiry was could furnish data which alone would set aside the accumulated research of this country and, indeed, of Europe, over many years, exhibits a notion of the progress of scientific research which is simply amazing. Before this happens, and even before the question can be entertained, it will be necessary for Dr. CUNINGHAM to reconcile his observations with those of numerous other Indian physicians equally favourably placed with himself for observation, who have come to conclusions absolutely diverse. His sweeping assertion at the meeting of the Medico-Chirurgical Society, that not a single fact existed in India which justified the theory of the contagiousness of cholera and the capability of transmission of the disease through water, may be left to Indian physicians to deal with. Practically no common ground for discussion was left when Mr. RADCLIFFE had shown that Dr. CUNINGHAM used the terms "contagion" and "water theory" in a sense peculiar to himself, and having nothing in common with the sense in which these terms are used in this country. This fallacy ran through the paper read at the Medical and Chirurgical Society, and it vitiates the whole of Dr. CUNINGHAM's report on the cholera epidemic of 1872 in Northern India. Dr. CUNINGHAM spoke of contagion as if it were held to be some self-operative Frankenstein giving laws to itself; and, finding that such is not the case, he holds contagion disproved. Again, he spoke of the contagion of cholera as if it were held to operate like the contagion of small-pox; and, finding that such is also not the case, he holds the contagion of cholera disproved. So of the "water theory" applied to cholera—he deals with it as if it were held to be some potent agency in the general dissemination and propagation of the disease, and not as an important agent of localisation; and, finding no evidence in proof of his conception, he holds this theory disproved. These fallacies affect every portion of the report on which his paper was founded.

Hardly less extraordinary was the fallacy that because India was the home of cholera, therefore observations made there had a pre-eminent advantage over observations conducted elsewhere. Dr. CUNINGHAM himself described, in the most forcible language, the impossibility of knowing what passes among the native populations with respect to cholera. Yet, notwithstanding a cautionary observation from Dr. BUCHANAN, Dr. CUNINGHAM claimed for Indian observations on the movements of cholera a higher value than for observations made among populations of which the state of health of every portion is known, and among whom cholera is only an occasional visitor! He made this claim on the strength of the constant supervision to which troops and prisoners in gaols could be subjected. As if troops and gaols were peculiar to India, and as if soldiers and prisoners there could be more completely dissociated from intercourse from the surrounding populations than soldiers and prisoners are here! Yet there are no facts in this country or on the continent of Europe, so far as we are aware, in which the occurrence of cholera in barracks and gaols has not furnished the strongest evidence of the high probability of English doctrines as to the propagation of cholera. India, no doubt, is, of all countries, the country in which *some* of the phenomena of cholera may be best studied, because most continuously studied. But among such phenomena those cannot be admitted which require a complete knowledge of all the circumstances of a surrounding population. From neglect of this consideration, absence of evidence of transmissibility of cholera among populations is treated throughout by Dr. CUNINGHAM as proof of non-transmissibility.

Another curious fallacy which largely affected Dr. CUNINGHAM's paper was the belief that a theory—as, for

example, the water theory—advanced to explain some facts was invalidated because it did not explain some other facts.

The part of Dr. CUNINGHAM'S paper which, perhaps, most enlisted attention was that which related to the *localisation* of cholera. Dr. CUNINGHAM speaks and writes of this peculiarity of cholera as if localisation were some entity. Sir WM. GULL observed that Dr. CUNINGHAM, in respect to localisation, reiterated what Dr. BALY and himself had advanced a quarter of a century before. But none of the speakers noted that the theory of the peculiar contagiousness and mode of diffusion of cholera had actually arisen out of the study of this very characteristic of localisation as observed in this country and on the continent, and which Dr. CUNINGHAM insists so strongly upon as the special characteristic of the disease in India. The same characteristic will be found, we have no hesitation in forecasting, to depend upon the same causes in both countries, when a similar method of research is followed.

IN an article last week we indicated the points of resemblance and of difference between septicæmia pure and simple and genuine pyæmia, and considered the various hypotheses which have been advanced concerning the local origin of the latter disease—that is, in so far as it arises from abnormal conditions of the tissues or the fluids of wounds. But the important facts which have been urged in favour of a constitutional origin of the disease must not be overlooked. More than one of the speakers in the late discussion were of opinion that, in some instances at least, an altered state of the general system may favour the development of unhealthy changes in wounds, which, in turn, give rise to constitutional infection. Dr. BASTIAN, for instance, alleged that there are good reasons for believing that the septic influences in pyæmia act principally on the constitution of the patient, and only secondarily on the wound. He had found in the fluids taken from wounds treated in the ordinary manner in hospitals, twenty-four hours after the dressings were applied, that in some instances the pus swarmed with bacteria, while in others no trace of them could be detected. He further stated that where the patient was healthy and the temperature low no bacteria or organisms were to be found, but where the temperature was as high as 101° they existed in abundance. He also affirmed that where they were present in the wound itself there was no reason for having recourse to aerial contamination, and thought the case might be similar where no abrasion existed. In short, Dr. BASTIAN'S view of the origin of pyæmia is somewhat as follows: primarily there is a febrile state of the system, which induces an unhealthy state of the wound, which in turn results in pyæmia. It must be confessed, however, that, whatever may be the value of these observations as applied to particular instances, they would fail to explain the majority of pyæmic cases. The fact that bacteria may be found in tissues not exposed to the air is no proof that, when they do occur in wounds, they have not been brought there by the medium of the air, or that their development has not been favoured by contact with the surrounding air, or at least with the numerous organic particles with which the air abounds. Against this supposed origin of pyæmia is the well-known fact that a high degree of pyrexia may exist in a patient who has a wound without any marked alteration of the secretions. It may therefore be asked—What is it that determines the development of pyæmia in some cases, while in others apparently similar no such manifestations occur? There is evidently some influence at work more occult than a pyrexial condition. It may be further objected that when the disease once springs up in the ward of a hospital, it is liable to spread from patient to patient, and to attack even convalescents whose wounds are wellnigh healed, and in whom no elevation of temperature is observed till the wound has taken on an unhealthy action and the poisoned condition of the system definitely declares itself. It is doubtless true, as Dr. STEWART'S experience testifies, that, in certain morbid conditions of the general system, pyæmia may supervene from apparently slight disturbing influences. And the changes which enforced rest and confinement induce in the general system of persons who have previously perhaps followed an active life must not be forgotten. A man, for instance, hitherto in good health, sustains a severe injury which necessitates confinement in the ward of a hospital, or in the room of a private house; his mode of life is suddenly changed, his functions are perverted, and his blood becomes charged with effete products which may induce increased vulnerability to pyæmic conditions, or may lead to such alterations in the secretions of his wounds as render them prone to undergo the retrogressive changes favourable to the development or absorption of pyæmic poison. It must be observed, however, that the evidence on which the belief in a non-traumatic origin of pyæmia is founded is too slight to justify any serious revolution in the pathological doctrines which at present obtain. Cases do occasionally present themselves in which the disease does apparently arise without the presence of a wound; but, granting the existence of such cases, it is not the less true that the great majority of the cases are preceded by unhealthy inflammatory conditions of wounds.

Having considered the nature of the *materies morbi* of pyæmia and the mode of its development, we shall now briefly inquire into the means by which it gains entrance into the general system and produces its characteristic effects. As already indicated, the usual, if not constant, place of entrance is the surface of a wound. But all wounds are not equally favourable to the admission of the morbific element. Some wounds, even of large size, are comparatively harmless; while others, although small, are exceedingly prone to become the seat of abnormal changes and the centre from which the poison spreads. Experimental and clinical experience show that there are at least three channels by which the poison may be absorbed—namely, the veins, the lymphatics, and the cellular tissues. That the veins are most frequently the channels by which the poison is admitted into the blood appears to have been satisfactorily proved; but the evidence of absorption by lymphatics and the cellular tissue is less clear and certain. From the earliest times the veins have been regarded as playing an important part in the production of pyæmia. In fact by some, even at this day, they are held to be the *fons et origo mali*. Formerly, it was thought that a suppurative

inflammation was set up in the veins adjoining a wound; and that the pus which was thus formed entered the general circulation, and in that manner produced not only the toxic but also the mechanical effects of the disease. But careful recent researches have shown the fallacy of this explanation. Now we know that pyæmia does not really mean pus in the blood, that suppurative phlebitis probably never exists, and that even the pus or pus-like cells which are found in the thrombi of veins are not the essential poisoners of the blood, but are accidental phenomena, the probable result of the migration of white blood-corpuscles. It would almost appear that the veins take a comparatively small part in the production of pyæmia. It is true that the experiments and observations of VIRCHOW have shown that the poisoned disintegrated thrombi which form in the veins may be not only the carriers of the poison, but may, by becoming arrested in some portion of the capillary system, give rise to lesions known as secondary deposits and inflammations. But there is nothing peculiar in the formation of thrombi in the veins of a patient suffering with pyæmia. Thrombi are necessary to normal repair; but in pyæmia, instead of undergoing the ordinary changes of healthy repair, they generally undergo softening and disintegration. But they do not always undergo this disintegration, for after death the most careful examination may fail to detect any disintegration of the clot. This fact affords one of the most striking arguments against the embolic origin of all secondary changes. It may be that, owing to the hyperinotic condition of the blood, small fragments of fibrin are constantly being deposited on the centripetal end of the thrombus, and are swept away again as soon as they reach the strong current of the collateral circulation. But even this explanation fails to account for the exudations and inflammations of tissues, not only topographically, but anatomically remote from the seat of the vein which supplies the thrombic fragments. A satisfactory solution of the difficulty may, we think, be found in the changes which exist in the blood, and by regarding the lymphatics and cellular tissues as sources of absorption of the poison. The blood not only contains an excess of white corpuscles and of fibrin, but it is altered in its physiological properties, either by containing suspended in it poisoned particles and poisoned fluids, or by the general changes which result from the fermentation set up catalytically by the presence of the morbific elements. In such a state of the blood there exist, therefore, certain conditions which are favourable to the development of secondary inflammations altogether apart from the influence of embolia. The white corpuscles of the blood which crowd along the walls of the capillaries may, under the altered relations between blood and tissue, become blocked in any portion of the capillary system; and being contaminated with poisonous material, they set up irritative changes, which result in extravasations, exudations, inflammations, and suppurations. These changes occur more frequently in some parts than in others; but what it is that determines the special disposition of certain tissues to react to altered blood conditions while others escape, we cannot say, but may describe it as a vulnerability of tissue. This vulnerability of certain tissues to certain poisons is exemplified in many diseases: in measles and small-pox, for instance, it is the skin; in rheumatism, it is the fibrous tissues and the joints; in typhoid fever, it is Peyer's glands, and so on; and in pyæmia it is not improbable that the serous membranes may be the points of election for the reaction to the morbific matter. It is, moreover, interesting to note that the secondary inflammations affect chiefly parts of great functional activity, and organs which in normal physiological conditions of nutrition aid in the elaboration and in the depuration of the blood. From this it would appear that in the morbid condition of the blood and tissues the ordinary processes of nutrition are perverted, and that irritative and inflammatory reaction results. Other causes of secondary inflammations may exist in the irritation which the poisoned matters may produce in the lymphatics. It may be true, as VIRCHOW has shown, that pus-cells cannot pass through lymphatic glands; but both the cells and the fluid of pus may get into the lymphatic vessels, and set up irritation and inflammation, either at the valves in the vessels or at the glands, so that inflammation and abscess may really arise in the course of lymphatic vessels at a considerable distance from any known gland. Lastly, the amœbiform movements and migratory character of living pus-cells and ordinary white blood-cells render probable the hypothesis that secondary inflammations and abscesses may have their origin from cells which have wandered along the cellular planes of the body to a distance comparatively remote from the seat of the wound. By either or both of these means secondary inflammations may arise which cannot be explained by the dissemination of poisoned emboli and their arrest in certain parts of the capillary system.

We have now considered some of the chief pathological facts of pyæmia, the essential nature of the disease, its mode of origin, and its chief mechanical and anatomical manifestations. We have purposely refrained from discussing the subtle questions concerning the changes which are imposed upon the blood by the action of the morbific material, as such a course would have led us too far into the domain of speculative pathology, our present object being merely to supplement the remarks which we made during the progress of the recent discussion on the indications for the prevention of pyæmia in hospital and private practice. We may thus sum up our knowledge:—The poisonous material of pyæmia, whatever be its real nature, is closely related to the suppurative process, and may actually originate in certain unhealthy conditions of that process. But even where the poison does not really arise in a suppurating wound, a certain disposition of the tissues of the wound is necessary to admit of its entrance into the general system. There are, for instance, strong facts to prove that a perfectly healthy state of a wound is to a great extent inhibitory to the absorption of the poison. BILLROTH has accounted for this on the ground that perfectly healthy granulations prevent the intromission of organic particles and fluids; and in the same way may be explained the cases where no evil effects result from the presence of decomposing fluids in wounds with healthy granulations. Whether this poison is capable of being transferred from one wound to another through the medium of the air may be doubtful, but there is strong evidence that the virus may be conveyed to wounds and implanted there by means of sponges, dressings, and instruments. The out-

come of all this is, that, if pyæmia is to be prevented, the well-established rules of surgery and hygiene must be persistently employed in the dressing of wounds and the treatment of patients.

WITHIN the large area of the Metropolitan Board of Works' jurisdiction the sewage question, at any rate in its most urgent aspect, has received a solution on a scale so extensive as to warrant the hope that no reconsideration of it will be needed for a generation. But outside the pale, all round the circle where the yearly increasing thousands of suburban residents are gradually converting what were once quiet little villages into large towns, between which and the metropolis itself there is in many cases no visible break of continuity, drainage and sewage disposal are problems at this moment confronting the local authorities and demanding a prompt solution.

There is Richmond, for example. We should be afraid to say how many schemes of one sort or another for disposing of the sewage have been put forward since the time when the Thames Conservators gave notice to the town that at a given date it must no longer use the river as a drainage outfall. Extensions of time were granted, to the detriment of the river, if to the convenience of the town; but eventually the Conservators appear to have put the law in force, and a fine was inflicted; but whether the difficulty has yet been settled by the adoption of a plan of drainage we do not for the moment recollect. Now the Richmond *rural* sanitary authority is in the field, seeking power to carry out a scheme for the drainage of Barnes, Mortlake, Kew, and Petersham, involving the power to take certain land at Barnes for the disposal of the sewage upon the intermittent downward filtration principle. Not unnaturally, the Barnes people are in arms against this scheme, and the usual battle has been fought before a Local Government Board inspector, whose report to head-quarters will be made in due course. It is a tremendous obstacle to overcome in respect of drainage that the land round London is so valuable for residential purposes. The notion of a sewage farm being located in such neighbourhoods is therefore certain to be met with the strongest possible opposition, and, as to combat this involves costly legal proceedings, we cannot wonder that local authorities, who know how unpopular such expenditure always is, are not inclined to move in the matter so long as they can avoid doing so.

At Twickenham, again, a drainage scheme has been under official investigation, and the inspector has given an adverse opinion upon the site selected for pumping and for utilising the sewage, which he deems too close to the town. He objects to the proximity of the works, not on the score of their being likely to affect prejudicially the health of the town, but rather because they would depreciate the value of property round about them.

And, lastly, we have our old friends Brentford and Ealing, which have been visited and reported upon by Major TULLOCH, who says of the former place that it is a wonder sickness should ever be absent from it. He advises that a covered sewer should be constructed for carrying away the whole of the sewage of Brentford and the effluent water from the Ealing sewage works, all of which now goes into the water course, and so into the Thames. But all this will cost a good deal of money; and there must first be an engineer employed to examine the district and propound a scheme which will have to be inquired into, and which may or may not be approved by the inspector. So it will probably be some time before the drainage question is settled at Brentford.

The subject of suburban drainage, and indeed of suburban administration generally, sadly needs taking in hand and settling upon a comprehensive basis. It is preposterous that localities which have grown to be as much part of London as the hands and feet are part of the human body should continue to be regarded as separate and distinct entities. The Metropolitan Board have jurisdiction over three millions and a quarter of persons located on 78,208 acres; and all these enjoy the privileges of good drainage, systematic water-supply, lighting, &c. Outside this region there is a belt of country spreading over 366,097 acres, and occupied in 1872 by 618,000 people whose numbers are increasing at a very rapid rate, all within the metropolitan jurisdiction, and to all intents and purposes treated as part of the metropolis for police purposes, but otherwise regarded as a congeries of parishes and hamlets having nothing whatever in common. This is an anomaly which was forcibly dwelt on in the Registrar-General's annual summary for 1872, whence, by way of conclusion, we extract the following paragraph:—

"What is at the present hour especially wanted is the breaking down of the restricted barriers of London, and the extension of municipal organisation to the well-considered boundaries laid down in Sir Robert Peel's Metropolitan Police Act, which seems to have taken the prospective increase of population into account. Any narrower boundary, while the population is increasing within the great circle at the rate of 75,000 annually, could only be temporary; whereas it is desirable to make the change once for all, or for at least the next hundred years."

Within this extended but well-defined limit the water-supply, the drainage, the lighting, the sanitary regulations, and all other details of administration should undoubtedly be under the supreme control of one municipality, such as we are not without hope of yet seeing established in London.

THE rapidity with which sensory impressions can be registered by an act of the will varies, it is well known, with the sensory organ that is excited, and the intensity of the impression that is made upon it. WUNDT found that, with impressions of medium intensity, the time occupied in perceiving the impression and making a voluntary movement of the finger to record it was—for sound, 0·1280 sec.; for light, 0·1747 sec.; and for touch, 0·1882 sec. Both HIRSCH and HANKEL, however, came to the conclusion that tactile impressions were perceived and registered with greater rapidity than luminous impressions, those of sound, however, being always most rapidly registered. With feeble impressions the rapidity of conduction seems to be about equal for all the senses; and there can be no question, from the observations of DONDERS and JAEGER, that expected nervous excitations can be registered more quickly than unexpected ones. In the experiments of all these observers, the time measured included the psychical operation required to form

and appropriately direct the movement by which the perception was registered; but in a paper recently published by Dr. S. EXNER in PFLÜGER'S *Archiv*, experiments are given in detail in which an attempt was made to determine the duration of a simple reflex act in which there can be no hesitation, so to speak, in the nervous centre as to the path into which the motor impulse should be directed to produce the movement registering it.

Dr. SIGISMUND EXNER took the act of winking as that best adapted to enable him to determine the time required for a complete reflex action from the application of the stimulus to the sensory nerve to the contraction of the muscle. He constructed, with this object in view, a very light lever of straw terminating in a bristle, which was applied to the lid, and the ordinary arrangements were made for the exact registration of the commencing contraction of the orbicularis. The stimulus was an electric spark, either passed in front of the eye and thus acting on the optic nerve, or exciting the fifth by striking directly on the cornea. In the latter case, the entire physiological time occupied in the reflex action—that is to say, the time occupied in the transmission of the sensation to the sensory centre, its reflection to the muscle, and the period of latent excitation in the muscle—was, if a strong electric stimulus was applied, 0·0471 of a second; if a weak one, 0·0555 of a second. These numbers can only be regarded as approximative, since the period of latent excitation of muscle in man is unknown, and Dr. EXNER was obliged to estimate it. He regards the possible error in the above estimate of the time occupied in the reflex action as on this ground equal to more or less than 0·01 of a second. He feels himself entitled to conclude, however, that the time required for a reflex action is not constant, but is shorter for strong impressions, longer for feeble impressions; and it is certainly shorter than is required for a voluntary movement consequent on a sensory impression—the latter, in such a case as that in which a finger of one hand is touched and one of the other is made to move, being from 0·0828 to 0·0775 or at highest 0·0740 of a second, though it must be admitted that the course travelled over by the nervous impulse is here considerably greater.

Another series of experiments, made with a view of determining the rapidity with which motor impulses are conducted through the spinal cord, were based on the fact that, on pricking the brain, medulla oblongata, and spinal cord in the frog, contraction of the gastrocnemii took place. By progressively descending from the brain to the lower regions of the cord, and timing the interval between the application of the stimulus and the contraction of the gastrocnemic muscles, an approximative estimate could be formed of the speed with which the nervous impulse travels. As the outcome of his experiments, EXNER states he has satisfied himself that an excitation applied to the brain in the frog experiences a check in traversing the great ganglia at its base; that after passing these the impulse travels with great velocity through the spinal cord, but before entering the motor roots it again experiences a check. By this means it acquires a certain degree of intensity, which causes it to be a more powerful stimulus to the muscle than even that produced by the crushing of the peripheric nerve itself.

Medical Annotations.

"Ne quid nimis."

THE RECENT VOTE OF THANKS TO THE ASHANTEE FORCES.

WHILE we gladly acknowledge that the present War Minister recognised in warm terms his sense of the importance of the services rendered by the medical officers during the late war, we cannot avoid regretting that the rule not to mention an officer by name, unless he had held a command in the field, was allowed to prevent the Government from specially including both the Royal Engineer and Medical Services in the vote of thanks accorded by Parliament to the forces under Sir Garnet Wolseley. Earl Derby's expression, that it was "a doctors' and engineers' war," has become hackneyed, from the fact that its aptitude and truth were at once generally recognised; and we think that, under the circumstances, those services might have been specially and separately named. Everything depended, as Dr. Lush pointed out, on the medical policy adopted in an enterprise of this kind, and it is notorious that its successful issue was owing to the care and judgment exercised by the medical service at home and on the Gold Coast, in selecting the proper season, in limiting the duration of the campaign, and in the sanitary, medical, and transport arrangements generally. In a campaign where climate, time, the nature of the country, and the absence of any local supplies were all against us, an incorrect judgment on the part of the medical authorities, or any hitch in the general and local arrangements, might have led to its being a very disastrous instead of a very successful affair. It is seldom, indeed, that the medical services have such an opportunity for exercising a great trust and showing their strength; but on this occasion we believe that the late Government reposed entire confidence in their advice and judgment, and they have had no reason to be disappointed. We are very glad to notice that Sir Garnet Wolseley spoke in the very highest terms of the services of the Medical Department.

MEDICAL EVIDENCE IN OPHTHALMIC CASES.

A CASE involving some difference of professional opinion recently occurred at the Durham Assizes, in which it was alleged that Mrs. Hayes, aged fifty-eight, who had previously made between £70 and £100 a year by letting lodgings, had sustained serious injury from an accident which occurred in June last on the North-Eastern Railway. She had been unable to take any lodgers at all since the receipt of her injuries, which were of so grave a nature as to require the attendance of a doctor to the extent of £120 in six months. The main question, however, was whether the patient was "totally blind" in the right eye, or whether there was still "a large measure of sight" remaining. The usual opposing evidence was given, but, if we may judge from the local newspaper report, the interest centred in that given by a local practitioner, Dr. Abrath. This gentleman stated that, although a German by birth, he was an "Englishman in medical matters," and, as a qualification for his duties as an expert in this case, he alleged that when he received his diploma he had been examined by Professor Helmholtz, the discoverer of the ophthalmoscope and the ophthalmometer. On being asked as to how long he thought the effect of atropine put into the eye would continue, he said that in a "nigger" he saw only for five hours, but that sometimes a single drop would last five days; but much depended upon the individual, and, he might have added, on the strength of the solution. It had been asserted on the part of the

defendants that the patient's pupil was movable, but Dr. Abrath alleged that it "did not move, and stood as fast as the Vendôme Column in Paris before it was blown down by powder." The optic disc in this case was moreover said to be paler on the inner side; but when asked whether this was not the normal condition, Dr. Abrath replied that much depended on the way that the vessels ran, and subsequently suggested that much depended on whether the vascular supply of the retina and optic disc were regarded from the standpoint of "German or English physiology or pathology." These are some of the points which distinguished this case; and, without making any comments on its merits, we may observe that it is confessedly difficult to detect a case of feigned amblyopia or blindness, but we think that a rational scepticism in alleged cases of blindness or diminished acuteness of vision after railway injuries is generally preferable to implicit reliance on the patient's statement. It is far from rare to find persons who have great diminution of vision of one eye from disuse alone, and yet this condition may never be detected by the person himself or only accidentally noticed. In fact, comparatively few persons perhaps possess equal acuteness of vision in both eyes. It is also well known that the sight of one eye may be very defective from the existence of some anomaly of refraction, myopia, hypermetropia, or astigmatism, the other eye being normal in every particular. The vision of one eye may indeed, from any of these causes, be apparently so deficient as to lead to the belief of a serious and irremediable affection of the eye, and yet all this may disappear by the employment of properly selected glasses. On the other hand, it must not be forgotten that serious imperfection of vision may exist with but slight perceptible ophthalmoscopic changes. The result of the case in question was that the jury returned a verdict for the plaintiff, damages £700.

THE HOSPITAL FOR WOMEN, SOHO-SQUARE.

WE have received a statement drawn up by six of the medical officers of the Hospital for Women, Soho-square, who have lately resigned their offices, together with copies of the correspondence between them and the General Committee by which the hospital is governed. The facts detailed in the statement seem to be borne out by the letters appended.

The medical officers would appear to have good reason to resent the way in which they have been treated. The Committee seem to have turned a deaf ear to their remonstrances against the mismanagement of the hospital, and to have resolved to set the wishes of the medical staff at defiance. Dr. Protheroe Smith, who was the only one of the staff enjoying a seat at the Committee, seems to have sided with the latter rather than with his colleagues, and to have thought that the due performance of their duty by the matron and nurses was no concern of the medical officers—an opinion in which we do not agree. Dr. Smith, however, in a letter to his colleagues, declined to assist them in investigating certain charges against the matron and nurses, made by the house-physician, on the ground that he was a member of the General Committee, before whom the matter might be brought; and, as a member of that Committee, he shares the responsibility for the insulting letter sent by the secretary to the medical staff, in which a joint committee of investigation is curtly refused, and in which the Committee state their opinion that the charges made by the staff "have little or no foundation, and do not in the least weaken their confidence in the matron."

The Committee of the Hospital for Women occupies a peculiar and enviable position in being self-elected, and it has the power to alter bye-laws &c. without appeal to the governors at large. This power it exercised on December 6th, 1873, by making the appointments of the medical staff annual instead of biennial, and by giving notice to the medical officers that their period of office would terminate at the end of the month, and that they must apply for re-election. As it appears from the printed copy of the bye-laws that they all underwent revision so lately as February 5th, 1873, it seems a little difficult to suppose that this sudden alteration could have been made except with the object of excluding some one or more members of the staff, and this was the view taken of it by the medical officers themselves. In answer to a protest from the medical staff, the Committee withdrew the clause requiring application for re-election, and postponed (as, indeed, they were legally bound to do) the re-election until January, 1875, but insisted upon the appointments being annual. Thereupon six of the medical staff—viz., Drs. Meadows, Edis, and Squarey, and Messrs. Scott, Heath, and Edgelow—tendered their resignations. The reply of the Committee accusing the medical staff of "subordinating the interests of the charity and the welfare of the patients to personal considerations" was so gross as to render the acceptance of their tardy offer to make the new law not applicable to the present staff impossible by gentlemen who respected themselves, and accordingly the six officers we have named have withdrawn, leaving the whole work of the hospital to Dr. Protheroe Smith, Dr. Heywood Smith, and Dr. Charles Carter.

The Hospital for Women has of late, it is true, gained somewhat in professional reputation—in great part through the efforts of the gentlemen who are now leaving it,—but it has always been regarded with considerable professional jealousy, mainly on account of the admission of patients at rates of payment unsuited for the recipients of a charity. It will be impossible, we believe, for the Committee to find gentlemen of position willing to take office upon the proposed terms, or while the powers and constitution of the Committee remain as at present.

ST. MERRY ANDREWS.

AN annual procession takes place at St. Andrews on what is called "Kate Kennedy's Day," in which the students defile through the streets like so many mountebanks, escorting a little girl, who is supposed to represent one Kate Kennedy, on horseback. The procession halts before the residence of each professor, and its members "demonstrate," after a pithecoid fashion, till the learned gentleman shows himself, when they salute him with cheers or groans according as he is "popular" or the reverse. A printed document is produced on the occasion in which the professors are made the subject of playful, generally satirical, allusion, but which, from the specimens communicated to us, is more remarkable for vulgarity than wit. The affair has always been held a nuisance by the authorities of the university, who have, accordingly, plucked up courage to do what they should have done long ago, and summarily put it down. On Friday, the 27th ult., they issued an ultimatum in which they threaten with rustication any student who shall enter the college in any kind of procession, or in any other than the ordinary dress; or who shall associate himself with the publication or distribution of any anonymous pamphlet; or, finally, who shall absent himself from any class for purposes connected with any procession. Holders of bursaries, moreover, who may violate these regulations shall, besides being rusticated, which involves the loss of one session, forfeit their bursaries. As already stated, this academic ukase has not, in our opinion, been issued a day too soon, and we hope we have heard the last of a "commemoration" which bade fair to deflect from St. Andrews the students who were beginning to prefer it to the other Scottish seats of learning.

THE "SPECTATOR" AND DR. WICKHAM LEGG.

A PARAGRAPH in a recent number of the *Spectator* must have been read by all members of our profession with equal astonishment and pain. In it a well-known physician, Dr. Wickham Legg, who holds and has held appointments of importance and responsibility, is made the subject of severe censure. He is held up to public indignation and to public reprobation as wanting in feelings of humanity, the absence of which is a grave reproach to any one, and most of all to a member of a profession the prime object of which is to lessen suffering. Into the value of Dr. Legg's experiments and their significance we do not now enter: we simply would point out the extraordinary principle on which our contemporary's recommendations are based. A scientific investigator, because he has performed experiments which the *Spectator* considers unjustifiable, is unfit to hold an appointment as teacher of a subject with which experiments on animals have nothing to do whatever. The ground is a broad one. The authorities of St. Bartholomew's Hospital are called upon to refuse an appointment to Dr. Legg which would be a step upwards in his professional career, and of his fitness for which there is no question, because certain experiments he has recorded involve an amount of pain to the animals experimented on which, in the opinion of our contemporary, was neither necessary nor justified by the value of the results obtained. Obviously the application of the principle cannot stop here. To be consistent, no man must be allowed to teach in our medical schools, or to hold any scientific appointment of value to himself or others, whatever his eminence, whatever the importance of his contributions to science, who has performed experiments on animals which an unprofessional judge considers unnecessary. With Dr. Legg would fall a host of men whose names have a European reputation for their contributions to our knowledge of disease and of its treatment. And would the cause of the friends of animals be furthered? Would the experimenters, who are such either from a love of science or a desire to lessen the sufferings of mankind, be prevented thereby from continuing their experiments? Scientific investigators are not to be rendered more humane by inflicting on them suffering more acute, injury more lasting than that which they may, perhaps from the best motives, have inflicted upon animals; nor in that way will the practice of vivisection be stopped.

HOSPITAL STOPPAGES FOR THE ARMY.

WHAT with the general sort of belief that the present Government is bound to re-establish or rehabilitate the idols of the past against which their iconoclastic predecessors waged war, and what with deputations from all sides, the Conservatives will have their hands full in devising reasons and conciliating a good many hopeful people who must inevitably be sent empty-handed away. There is, however, a little piece of practical legislation to which Mr. Gathorne Hardy might turn his attention. His predecessor in office introduced a regulation into the army by which every soldier suffering from any disease induced by his own misconduct was to be mulcted of all his pay. Now, we have always advocated that the soldier whose disease is clearly attributable to causes connected with duty should not be subjected to the same rate of hospital stoppage as another suffering from a disease resulting from misconduct; but that is a very different thing from the existing rule, by which the latter is deprived altogether of his daily pay. To constitute the medical officer a judge of what was or was not the result of misconduct, moreover, is calculated to destroy the confidence that should exist between him and the patients under his charge. There must occasionally be great difficulty in defining what affections should fall within the meaning and spirit of the regulation, and as the practice of medical officers will vary according as they are strict or lax in the interpretation of the order, a sense of injustice is very likely to be engendered in the soldier. We hope, therefore, that the present War Minister may be led to modify the recent regulations as to hospital stoppages. Instead of entirely depriving the vicious class of soldiers of their pay, let a reduction be made in the rate of hospital stoppage imposed on the well-conducted soldier, and let it be added to the rate laid upon the other class; and as regards the class of cases in which a higher rate of stoppage is levied, let the diseases be such only as are clearly the direct results of vice or intemperance. This seems to us a reasonable and fair compromise, and would have the effect of making a distinction, by rewarding the good at the expense of the opposite class.

HEALTH OF SCARBOROUGH.

FROM Dr. Taylor's annual report we learn that the constant and increasing attention given to sanitary improvements in Scarborough is producing good results, the number of deaths registered in 1873 having been 500, whereas they were 523 in the previous year. The death-rate among the strictly residential population is given at 18·1 per 1000 in 1873, and 20·2 per 1000 in 1872. Analysis of the causes of death shows a marked falling off in fatal zymotics, which killed 92 persons in 1872, and but 44 last year. Small-pox does not appear in the list of fatal diseases at all, though it was so very prevalent in 1872, and only 3 deaths from typhoid fever are recorded. With respect to 2 deaths from typhus, Dr. Taylor observes that they were both imported from other places. Of 24 fatal cases of diarrhœa, 17 were of infants in their first year, as compared with 30 from the same cause at the same age in 1872. Infant mortality has ruled high in Scarborough, and a chief cause of this, in Dr. Taylor's opinion, is that the services of the mothers are in such great demand at the hotels and lodging-houses during the season that they are constrained to leave their infants in the care of persons too often either careless or inexperienced in the proper management of children. To meet this state of things, an infant day nursery or *crèche* has been established through the influence of benevolent inhabitants of the town, and there is no doubt that when the mothers, who at present are shy of the novelty, get to understand the advantages of such an institution, a considerable saving of infant life will follow. Already it is found that the mortality among 1682 infants received in 1873 was less than 4 per cent., while those put out to nurse in the ordinary way die at the rate of 60 per cent. Rapid progress had been made with sewerage extension, and especially with sewer ventilation, as recommended by Mr. Bazalgette in 1872. The authorities seem to be fully alive to their responsibilities in a sanitary point of view, and they may rest assured that no trouble or expense will be ill-bestowed which has for its object to render the reputation of Scarborough as a health resort unassailable.

THE ELY WATER-SUPPLY.

AT the request of the Local Board of Health, Dr. Frankland has submitted to analysis samples of water obtained from the general water-supply of the town of Ely, and has issued a report on the subject.

It appears the town derives its water from the Ouse, a river of which the Cam is an important tributary, and into which the whole sewage of Cambridge passes. The distance of the latter town from Ely is about twenty miles by river. The water before delivery is filtered through sand, gravel,

and wood charcoal. An analysis of the filtered water showed that 100,000 lb. had been polluted with an amount of animal matter equal to that contained in 1260 lb. of average London sewage. At the time the analysis was made the whole of this animal matter had been oxidised and converted into innocuous compounds, but, as Dr. Frankland remarks, there is always a risk lest some portions of the noxious constituents should escape that degree of decomposition which would render the water safe for domestic purposes. It is, therefore, best to avoid the use of water which has been polluted with excrementitious matter.

The report cannot fail to excite a feeling of lively apprehension among the inhabitants of Ely. Independently of the disgusting idea of using water which, even when filtered, contains so large a proportion of sewage matter, there is always the fear lest infectious excreta should at any time be present in the sewage, and give rise to epidemics of typhoid fever and cholera. Nor is the present insanitary condition of Cambridge likely to reassure the Ely townspeople on this point.

As it is difficult, if not impossible, for Ely to obtain a sufficient water-supply otherwise than from the river Ouse, the Local Board of Health will, we have reason to believe, endeavour to restrain the Cambridge sanitary authority from polluting the Cam with the sewage of that town. Such a step would materially add to the health, safety, and comfort of both towns.

CHLORAL HYDRATE SUCCESSFULLY USED IN TETANUS.

DR. CORYLLOS, of Patras in Greece, published a case of this kind in the *Allgem. Weiner Med. Zeit.*, No. 2, 1873, and now the same author records two similar cases, one under his own care, and the other treated by Dr. Basilin. The latter case relates to a woman of forty, who had wounded her finger with a splinter, which she removed herself. Tetanus occurred one month after the accident, and she had more than ten general attacks in the twenty-four hours. Sixteen days after the first tetanic symptoms the patient removed from the wound a bit of splinter, the size of a pea, which had been left in it unobserved. The usual narcotics having failed, chloral was tried and succeeded. Altogether three ounces and a half were taken in twenty days.

In Dr. Coryllos' case a man of forty had his left temple wounded by a pointed piece of reed. Tetanus supervened, and here, again, a portion of the foreign body was removed twelve days after the accident. He had at first fifteen-grain doses of chloral, and improved much upon them. But the tetanus recurred with renewed severity, and the chloral was pushed as far as 120 grains per diem. The patient completely recovered, and had taken, in about thirty days, six ounces of chloral.

UNSEAWORTHY SAILORS.

THERE is an article on this subject in the current number of the *Nautical*, which we may, without much scruple, fairly take to be the outcome of numberless iterations in THE LANCET since the Merchant Shipping Act of 1867 came into operation. The article very properly follows our cue in urging the application of the Contagious Diseases Act in all mercantile as well as Royal Navy ports, and it might have urged, with equal propriety, the inspection of seamen before signing articles, if, in the opinion of the master who is engaging them, they appear physically unfit for duty afloat. It is probable that the attention of the Royal Commission now sitting will be officially directed to unseaworthy sailors as well as ships, for, as we have constantly reminded the Board of Trade, it is a duty to see that the vital belongings of every vessel are in at least as good order as the hull, spars, and running gear. We commend the foregoing to the attention of Mr. Plimsoll, who appears to have forgotten that there are unseaworthy sailors as well as unseaworthy ships.

HULL GENERAL INFIRMARY.

AT the ninety-first annual meeting of the governors of this infirmary, Mr. Alderman Seaton in the chair, it was decided to appoint a pathologist to the institution at a salary of £100 a year, the sum of £350 being voted towards providing the necessary apparatus and accommodation for such an officer. We are glad to observe the inauguration of this important office, and cordially endorse all that Dr. King said in moving the appointment of a paid pathologist. It would be absurd to expect a gentleman in a provincial town to devote the time and labour demanded by the onerous duties of the office without a fairly adequate stipend, and it is a matter for congratulation that an amendment to postpone the question, in view of appointing an unpaid pathologist, was not seconded. At the same meeting, Sir Henry Cooper was appointed consulting physician in the following terms:—

"That this meeting, deeply regretting the resignation of Sir Henry Cooper, the senior physician of the Hull Infirmary, begs he will accept their most cordial thanks for the honorary and devoted services he has rendered to the institution during a period of more than thirty years. After so long a period of faithful and public services, Sir Henry must take with him to his retirement the pleasing and proud reflection that the gratitude expressed by this meeting of Governors is shared by a large section of the community, more especially by the thousands who, through this hospital, have directly or indirectly benefited from his professional services. This meeting ventures also to express the hope that Sir Henry will maintain his association with the charity by accepting the position of honorary consulting physician hereby offered to him."

THE COLLEGE OF PHYSICIANS AND THE NEW GOVERNMENT.

THE Corporation of the Royal College of Physicians have memorialised the Right Hon. B. Disraeli on the subject of overcrowding in London. The memorialists express a hope that the Premier will favour them by holding out some prospect that the question of improving the dwellings of the poor, upon which the health and morality of the people so much depend, will be taken up by the Government in the present session of Parliament. We have every reason to believe that a declaration from such an important body as the College of Physicians will always meet with Mr. Disraeli's cordial consideration.

SANITARY NOTES.

WE have received a pamphlet "On Hospitals, Cottage Hospitals, and Ventilation," by Dr. Charles Shrimpton, which contains much that is true, though not new. With reference to the treatment of puerperal cases in hospitals, he records that in the little wooden hut used by the soldiers' wives on the edge of Shorncliffe, and open to all winds, "there had been up to the 29th of December, 1869, 702 deliveries without one single death from puerperal disease," and that in a similar hut in the camp at Colchester, up to October, 1870, 202 deliveries had been registered, and no deaths.

A preliminary report on the Shropshire combined Sanitary District has just been presented to his Committee by Dr. W. N. Thursfield. The writer gives (1) the general statistics of the district, (2) the means adopted to obtain information as to deaths and disease, (3) the statistics of disease, (4) a report on typhoid, (5) the removal of nuisances, (6) an abstract of reports from sanitary inspectors,

(7) bye-laws. The chapter on typhoid may be very properly commended to the notice of householders, landlords, and tenants who deny and affect to ignore the existence of sanitary defects in rural districts, for it is not hampered with scientific verbiage, and the details are given almost literally in chapter and verse. There is a great deal of good information in this report indifferently arranged, and we observe in this, as in other similar reports, want of care as to orthography and general style.

LONDON AND COUNTRY HOSPITALS.

WE are very glad to be informed, on unquestionable authority, that there is no foundation for the statement as to the intention of the shareholders to dispose of the International College, Spring Grove, Middlesex, or for the necessity for the same, and that, consequently, there is no probability of its being purchased by the Baroness Burdett Coutts as a sanatorium. If the convalescents from our London hospitals lose the opportunity of re-establishing their health there, the rising generation of international scholars are, at any rate, to be congratulated on the prospect of possessing a fine and salubriously placed college, with its ample playgrounds and pleasant walks, where they can lay up for themselves stores of health and enjoyment.

THE ACTIVE AGENT OF ERGOT.

DR. A. WERNICH has recently made some investigations in regard to the active principle of ergot in the Berlin Institute. He finds that the watery extract is far more powerful than either the alcoholic or the ethereal extract. The watery extract, when purified by alcohol and ether, forms a mucous or slimy mass which cannot be dried. The active agent appears to be of the nature of an acid soluble in alcohol when pure, but insoluble when in combination with bases.

LONDON WATER.

DR. FRANKLAND'S report on the quality of the metropolitan water-supply during last month is not a very pleasant one for the consumers to reflect upon. He states that all the waters drawn from the Thames and Lea rivers, except that supplied by the New River Company, was "much polluted by organic matter." With three exceptions, the whole of the river-supply appears to have been "slightly turbid, and contained living and moving organisms." In Dr. Frankland's opinion, "it was not fit to be used for dietetic purposes."

HOSPITALS AND PRIVATE PRACTICE.

UNDER this heading we called attention, three weeks ago, to the complaint of Mr. Elwin, of the City-road, against the interference of Mr. E. Jepson, one of the house-surgeons of St. Bartholomew's Hospital, with one of the former gentleman's private patients. It is certainly not creditable to either Mr. Jepson's sense of professional propriety or to the good name of the hospital with which he is connected that, up to the present time, Mr. Elwin has received no explanation whatever from Mr. Jepson himself or any of the authorities of St. Bartholomew's.

THE "VICTOR EMANUEL."

WE have intelligence of this vessel on her arrival at St. Vincent. The general condition of sick and wounded was satisfactory. It is understood that the *Victor Emanuel* will proceed slowly to England in order to accustom the invalids to the change of climate.

THE will and three codicils of the late Dr. Forbes Benignus Winslow have been proved under £45,000.

MR. LIDDLE, medical officer of health for Whitechapel, in a recent and able report on the sanitary condition of his district, expresses his opinion that the best plan of remedying overcrowding in densely populated localities is for the Metropolitan Board of Works to obtain powers for the compulsory purchase of lands and houses which are unfit for habitation, and sell the ground either to private individuals or public companies, for the purpose of erecting suitable houses for the use of the working classes. So long as the poor are allowed to remain huddled together in narrow courts and alleys, into which no persons except the police and medical men and sanitary officers enter, little or no improvement can take place in the moral, physical, or intellectual state of the people.

A COMPLIMENTARY dinner was given last week, at the Albion Tavern, to Dr. Cortis, by the Caterham Committee of the Metropolitan Asylums District. Major-General Sir Henry de Bathe, who presided on the occasion, testified, in highly eulogistic terms, to the valuable services rendered by Dr. Cortis in the administration of the Caterham Asylum, and to the great esteem entertained for him by the committee of which he is now chairman. Dr. Cortis has worked zealously on the Caterham Committee for seven years, and fully deserves the compliment paid him. A more thorough appreciation of his exertions in connexion with the asylum could not well be devised, and he has our hearty congratulations on the event.

WE have over and over again insisted on the absolute necessity of erecting a substantial and commodious mortuary in every parish in the metropolis. Many such buildings have been erected during the last twelve months. Clerkenwell, however, is still without the accommodation necessary to perform with decency a post-mortem examination. At an inquest held before Dr. Lankester last week, on the body of a suicide, Mr. Dyer, a medical practitioner residing in the district, complained that he had to make the autopsy in a small back room in which members of the family of the deceased lived, ate, and slept. We hope the local authorities will give their attention to the matter.

AT a meeting of the National Association for the Promotion of Science held this week, under the presidency of Mr. F. S. Powell, late M.P., Dr. Hardwicke, medical officer of health for Paddington, read a paper on the "Abolition of private slaughterhouses in towns, and on future legislation for noxious trades." Like nearly all the other metropolitan medical officers of health, Dr. Hardwicke strongly condemns private slaughterhouses, and as strongly urges the necessity and expediency of erecting public abattoirs. An interesting discussion followed the reading of the paper, in which Mr. Gamgee, Dr. A. Carpenter, Dr. Ross, and others took part.

A MARBLE bust of the Baroness Burdett Coutts has just been completed by Mr. W. Brodie, R.S.A. The work is highly successful, particularly in expressing the good sense and good feeling of the original, and that decision of purpose which would be almost stern but for the sweetness of temper conveyed by the features, especially those of the mouth. It will be exhibited, we believe, at the Royal Academy.

MR. THOMS has found another centenarian, and in *The Times* of Monday last gives the world a detailed report of the case which would have satisfied Sir G. C. Lewis. We have no reason to doubt the exceptional longevity of Mr. Anthony Beresford, who died at Alstonfield on the 3rd ult., aged 102 years and a few days.

EXAGGERATED reports of the amount of epidemic disease existing in Stockholm have lately appeared in the pages of some of our foreign contemporaries. We are enabled to state that although, during the months of January and February, typhus and small-pox were unusually prevalent among the population, causing considerable anxiety to the authorities, the health of the town is now fairly good. Since the outbreak of small-pox in November last, there were recorded 2349 cases, of which 492 proved fatal. During the same period, typhus was credited with 51 deaths out of 336 cases.

THERE are probably many of our readers who have taken an interest in the discussion now going on regarding the merits of cremation who are not aware that such a mode of disposing of the dead is regularly performed in India, where the practice has been hallowed by the usage of centuries, under the supervision of English officials. In many of the cities in the Punjaub, men acting under the orders of a surgeon are stationed at the cremation grounds, whose duty it is to see that the bodies are properly and completely burned.

DURING the month of February there were registered, in the eight principal towns of Scotland, 2464 deaths, 40 per cent. being of children under five years of age. Scarlatina was very prevalent and fatal in Dundee and Paisley, causing 166 deaths. Under the head of fever 64 deaths were registered, 22 being due to typhus. Small-pox caused 41 deaths, of which 32 occurred in Glasgow. The mortality from phthisis amounted to 271, while 528 deaths were due to inflammatory diseases of the respiratory organs.

THE following members of the profession were presented at the recent Levée:—Surgeon M. L. Bartholomeusz, Bombay Army; Surgeon L. Corban, 21st Hussars; Surgeon William Launcelotte Gubbins, M.B., Army Medical Department; Surgeon Frank Powell, Indian Medical Service; Surgeon J. A. W. Spence, Madras Army; Surgeon T. J. H. Wilkins, Madras Army.

WE would remind our readers that the annual meeting of the Poor-law Medical Officers' Association, of which we have already given notice, will be held on Wednesday next, April 8th, at the rooms of the Century Club, 6, Pall Mall-place, under the presidency of Dr. Lush, M.P.

THE *Standard* states that a furnace for cremation is now in process of construction by Herr Friedrich Siemens, a civil engineer, of Leipzig. Its cost is estimated at 5000 marks, or £250, and it is calculated that the complete combustion of a human corpse will take about an hour.

SIR GEORGE BURROWS, Bart., M.D., F.R.S., was, on the 30th ult., re-elected, for the fourth time, President of the Royal College of Physicians—a post to which seniority was among the least of his many claims.

IN the extra number of the *Illustrated London News*, entitled "From Cape Coast to Coomassie," the profession will find much to cherish as a memento of what was emphatically a "doctors'" even more than an "engineers' war."

ON Easter Monday a meeting will be held in the Queen-street Hall of Edinburgh, to promote the extension and improvement of the buildings of the University.

WE are informed that the funds of the Dental Hospital benefited to the extent of more than £100 by the vocal exertions of the "Mayfair Minstrels" on the 11th inst.

REPORT
OF
The Lancet Sanitary Commission
ON
THE INFLUENCE OF CERTAIN CHEMICAL MANUFACTURES ON HEALTH.

No. I.

FEW sanitary problems possess greater national importance or are surrounded with graver difficulties than the comparative effects of different occupations on the health of the persons employed in them. Much, it is true, has been written on the subject, and now and then an outcry raised which has resulted in more or less good; but of trustworthy statistical information or accurate scientific study there has as yet been very little. Of course it is generally possible, by careful inspection, by examination of the workpeople, by the study of hospital and club statistics, and by conference with the medical men of the neighbourhood, to judge whether a given trade or manufacture is, upon the whole, beneficial or noxious to the health of those engaged in it; but when we attempt to go beyond this, and ascertain the precise extent to which mischief is done and the several influences of different branches of the same manufacture, we are too often arrested by an almost complete lack of evidence. It is even impossible to fix with any approach to accuracy the comparative mortality in different trades. Individual efforts, such as those of Mr. Neison and Dr. Guy, have done something in this direction; and some calculations founded on the Census of 1861 were given in the supplement to the twenty-fifth report of the Registrar-General (1864), but these last are, as we have ascertained from examination, all but worthless.

This great defect in our sanitary knowledge has been brought home to us vividly during a recent tour of inspection through some of our large manufacturing centres. The primary object of this tour may be briefly explained. Somewhat circumstantial rumours had reached us from more than one source of serious injury to the health and even life of the workpeople engaged in the manufacture of chloride of lime, or bleaching powder. The gravity of the charge, together with the enormous magnitude of the suspected manufacture, rendered it our duty to institute the inquiries the main results of which we now communicate to our readers.

Before, however, entering into details, we wish to acknowledge with gratitude the cordial assistance which we received from everyone to whom we applied for information. We applied to many manufacturers, and visited many works. In every single case the works were thrown open to us, and the utmost pains were taken to show us all that could be seen, and to tell us all that could be told. Our limits of time prevented us from visiting many important works, but this was from no want of courtesy in the managers. It is almost invidious to mention names, but we cannot avoid expressing our especial thanks to Mr. Deacon, of the firm of Gaskell, Deacon, and Co., of Widnes; and to Mr. Allhusen, of the Newcastle Chemical Works, whose valuable time and large experience were placed freely at our disposal. We must also thank the numerous medical men to whom we applied for their cordial and invaluable help. Without the assistance of Drs. Philipson, Lyle, and Page, and Mr. Armstrong, of Newcastle; Mr. Cooper, of Widnes; and Mr. McNicol, of St. Helens, in particular, the inquiry would have been abortive. As it was we believe we gathered almost as much as could be learnt without a protracted investigation.

The alkali manufacture may be taken as including as its chief items the manufacture of sulphuric acid, carbonate of soda, and bleaching powder, together with caustic soda

and bicarbonate of soda. In many respects it is a typical industry, not only on account of its magnitude, but also on account of the many other manufactures which depend upon it. To render our remarks intelligible, it will be necessary to give a slight sketch of the mode in which the manufacture, or rather series of manufactures, is conducted.

The first stage is the preparation of sulphuric acid by Roebuck's well-known process, now more than a century old. In this, as everyone knows, iron pyrites is burnt in a series of furnaces, and the sulphurous acid so formed oxidised in enormous leaden chambers by the agency of nitrous fumes. The process has been carried to a high degree of perfection, and is not attended with the production of any deleterious fumes.

The sulphuric acid so prepared is used in the decomposition of common salt, sulphate of soda, or "salt-cake," hydrochloric acid being the product obtained. The materials are first heated gently in cast-iron covered pans called "decomposers." About half the chlorine is here expelled as hydrochloric acid, and the pasty mass is then pushed forward into reverberatory furnaces or "roasters," in which it is exposed to a temperature of about 2000° F., and the decomposition thereby completed. The hydrochloric acid both from the decomposers and roasters is carried to towers filled with coke or bricks, down which a stream of water trickles. The Alkali Act of 1863 compels the condensation of 95 per cent. of all the acid evolved, and by the above arrangement a much larger proportion than this is condensed in all well-managed works. While the salt-cake is still red-hot the doors of the roasters are opened, and the salt raked out into iron barrows, by which it is carried to a store. This is the first stage of the process in which any noxious vapours are perceived. The hot sulphate emits a cloud of hydrochloric-acid fumes, which are very irritating to the lungs, and sometimes almost stifling. There seems to be a great difference in the arrangements of the decomposing houses in different factories. It is very important that the roofs should be high and well ventilated, and where these conditions are not preserved it can hardly be doubted that great injury must be done, at any rate, in individual cases. Of course the men get inured to the fumes, and do not complain much, and equally of course they do not do what they might to avoid direct exposure. We watched one man who was raking out a charge, and we noticed that he stood as if on purpose exactly in the line in which the torrent of acid stream was drifting.

A process has been recently patented by Mr. Hargreaves, which, it is said, may revolutionise the manufacture of salt-cake. This process, which is a modification of several older methods, consists in passing sulphurous acid, steam, and air through hot chambers containing common salt moulded into lumps with water. This of course renders the previous manufacture of sulphuric acid unnecessary, and would abolish in alkali works the complex and expensive leaden chambers. Of the sanitary influence of the process we can say nothing, not having seen it in operation.

The salt-cake, mixed with coal-dust and chalk or limestone, is next thrown into a reverberatory furnace and fused at a very high temperature. Enormous revolving reverberatories of drum-like form are now replacing the fixed furnaces, but in both the reaction is the same. A black mass called "black ash" or "ball soda" is obtained, which consists essentially of carbonate of soda and sulphide of calcium, together with unaltered chalk, carbonaceous matters, and other impurities. From this the carbonate can be extracted by lixiviation with water, and obtained in the dry state by evaporation. The "soda ash" so obtained is very impure, but we need not pursue its history, as it has no bearing on our present subject.

In the black ash process no fumes are evolved, and no evils can arise from it except those incident to all furnace work. These, though perhaps more serious than is sometimes supposed, are, we presume, unavoidable.

The residue left in the tanks after the removal of the soda by solution contains not less than 80 per cent. of the sulphur of the pyrites, chiefly in the state of sulphide of calcium. It is known as "alkali waste" or "tank waste," and is a source of great trouble to the manufacturers, and in some cases of annoyance to their neighbours, producing serious pollution of air and water. This question, however, must be discussed on another occasion.

We come now to the various means by which the hydrochloric acid—which, as we have already seen, is formed as a by-product during the manufacture of salt-cake—is utilised. One portion is employed in the manufacture of the so-called bicarbonate of soda. Carbonic acid, produced by the action of hydrochloric acid on chalk or limestone, is brought into contact with soda crystals in air-tight chambers. The water of crystallisation drains away from the crystals, and they effloresce to white masses, which have simply to be dried and pulverised to be fit for market. No part of this process is in the slightest degree noxious.

Another portion of hydrochloric acid is now employed by some firms in recovering sulphur from alkali waste. Many methods have been tried unsuccessfully for the attainment of this important object, but there is reason to hope that at last the great problem has been solved by Mr. L. Mond, whose process has been adopted on a large scale by several of the leading manufacturers. The chemical details of this process are exceedingly complex, but the general features may be described in a few words. Air is blown through the waste until a portion, but not the whole, of the sulphide of calcium is oxidised into hyposulphite. Such a mixture, lixiviated with water and the solution treated in a peculiar manner with hydrochloric acid, is said to yield nothing but chloride of calcium and free sulphur, which last can of course be used again for the manufacture of sulphuric acid. Mr. Mond states that at the present time 100,000 tons of hydrochloric acid are thrown away or wasted every year in England, and that this is more than double the quantity required for the recovery of the sulphur from all the alkali waste in the country. Of course we do not pretend to judge of the commercial merits of this process, but, as it would do away with the evils arising from the alkali waste, we must on sanitary grounds hope for its success.

But the most important of the commercial applications of hydrochloric acid is in the manufacture of bleaching-powder. The process generally employed for this purpose is too well known to require much description. Hydrochloric acid is heated with oxide of manganese, which liberates one-half of the chlorine of the acid. The gas is carried by pipes to large air-tight chambers of lead or stone, on the floors of which slaked lime has been strewn to a depth of several inches. The contact of chlorine with the lime is continued until about 35 per cent. of available chlorine has been absorbed. Then the supply of chlorine is stopped, a little lime is, or should be—for it is often neglected,—thrown in to absorb the last traces of the gas, and, after a suitable interval, doors are thrown open at each end, and air allowed to circulate inside.

Then comes the dangerous part of the process. Men have to go into the chambers to remove the powder, and pack it in casks. In doing this they are exposed to two distinct dangers: firstly, from chlorine gas still hanging about the chambers; and, secondly, from the fine and peculiarly irritating dust of bleaching-powder, which, as soon as the shovels are used, flies upward and loads the air. From each of these dangers the men can guard themselves to a greater or less extent. It is only necessary to wait until the chlorine fumes are thoroughly expelled to avoid all danger from that source, and the second danger is greatly diminished, if not annihilated, by the use of the respirators or mufflers which are provided for the purpose. One of these respirators is shown in the annexed engraving, taken from one of several photographs kindly supplied to us by Messrs. Gaskell, Deacon, and Co., of Widnes. It consists of many folds of soft flannel bound closely around the mouth and nostrils, and acts, of course, just like the cotton-wool so much and so justly belauded by Prof. Tyndall. We greatly doubt whether either of these precautions is sufficient. On breezy days, when the circulation of air takes place quickly, the chambers are soon fit for entry; but on heavy, foggy days, a considerable time is required, and it is easy to understand that the men, anxious to have their work done and get off home, or, as happens too often, to the nearest public-house, are but too apt to go in whilst the chambers are still poisonous with the gas. We tried the experiment, and so did a friend, a distinguished member of Parliament, who visited one large factory a day or two before we did, and who conveyed our joint experience in the following pithy telegram:—"Been in the chamber; coughing ever since." The respirator is no doubt a good protection from the dust; indeed, we found a handkerchief to answer very well. But the work in the chambers is

hard, the men come out bathed in perspiration, with hair, whiskers, and eyebrows covered with white dust, and, to all appearances, a good deal exhausted. It therefore appeared to us doubtful whether the continued pressure of

the flannel on the mouth and nostrils could be borne continuously for an hour or two. There would, we fear, be considerable temptation to slip it aside now and then, if only for a few minutes.

We must reserve for another article some remarks on the modern improvements in the chlorine manufacture, as well as the conclusions to which we were led by the whole inquiry.

THE SIAMESE TWINS.

SUPPLEMENTARY REPORT.

WE have been privileged by Mr. Gardner to select from his great Collection of Facts on the History of London a few circumstances relating to the Siamese Twins at the period of their visit to this metropolis in the year 1829, when they themselves were eighteen years of age. On the occasion of this visit, before the twins were exhibited to the public, they were shown at a "private levée," at which were present, with many other celebrities of the day, Sir Astley Cooper, Sir Anthony Carlisle, Mr. Thomas, Dr. Holland, Sir Francis Burdett, and though last to be named, not least, the famous anatomist, Mr. Joshua Brookes. Brookes at this time was the leading anatomist of London, and his museum and dissecting-room at Blenheim-place, Oxford-street, now a dyer's establishment, was the anatomical school we had almost said of England. He was the last of our great English anatomists, of the men who devoted all their lives to the art of teaching this science. How extensively he was known and how sincerely he was honoured is indicated by the presence of his portrait in the consulting-rooms of the medical fraternity throughout the land. But we must leave Brookes for another day, except in so far as our present purpose is concerned.

At the "private levée" Brookes made an examination of the band that held the twins together, and, as if some doubt existed whether the band were a true natural formation, he wrote out a certificate, which was signed by several other eminent medical men, and which affirmed "that the twins were a great natural curiosity, and that there was no deception." Sir Astley Cooper also examined the band, and declared that it contained cartilage. In later years this fact was so clear, we might almost wonder so eminent an authority as Sir Astley Cooper should have been quoted in respect to it; but we find that in the early life of the brothers the cartilaginous structure was not so obvious. It was stated by Mr. Hunter, who knew the twins from the time they were twelve years old, that between the age of fourteen and eighteen the band connecting them had become more cartilaginous, so that it would seem as if the cartilage, in early life, was too soft and flexible to be distinguished from the fleshy substance.

From a report in *Bell's Weekly* of 1829 we gather that the appearance of the brothers was healthy, their disposition cheerful, and their attitudes and motions graceful. None of their actions or proceedings betrayed any symptom of suffering or feeling of inconvenience occasioned by their forced proximity. They could "swim across the room" with all the ease and grace of a couple skilfully waltzing, and they seemed never to have any difference of intention or purpose which could give pain to them by making them pull in opposite ways. This identity of purpose and unity of movement, combined with a general similarity of tastes, dispositions, and habits, created amongst some a suspicion that their organisation was more intimately connected than at first sight appeared. They were said to fall asleep and to wake at the same moment, and that one of them could not be roused in the night without immediately exciting the vigilance of his companion. They both generally directed their eyes towards the same object, and it was remarked that on being conveyed through the town in a coach they could not be induced to look out of its opposite windows. Their health, it was alleged, became robust or declined at the same time, and whatever affected the one seemed in the same way to affect the other.

It was observed at the same time that, notwithstanding all these points of similarity, the boys had separate purposes, sentiments, and volitions. Their memory and other faculties were as distinct as if they were "far as the poles asunder." Their nervous system, their circulation and bodily organs, with all their functions, were likewise as independent as if the band which connected them were a "metallic hinge." None of the facts authentically stated show that there was any other interchange of sensation or feeling than their perpetual proximity would occasion; and their keepers, who affirmed that they fell asleep and awoke at the same time, did not assert that they had the same dreams.

At this period the question of the separation of the twins by operation was considered, and it was assumed that if the induration of cartilage which had then commenced continued all danger of effecting the separation would be removed. But it was observed "a dissolution of partnership is not likely to be attempted so long as union is profitable to the firm."

An extremely interesting letter on the twins was published by Sir Anthony Carlisle. It bears date Langham-place, November 24th, 1829. Sir Anthony states that the band connecting the boys was placed immediately below their respective breast-bones. This "joining part," he adds, "presents a surface of natural and healthy skin, and to the feel it seems to include an extension from each of the cartilages which terminate the breast-bones. The entire band admits four fingers to pass freely behind it, when the boys stand shoulder to shoulder, and its width and thickness allow the thumb to meet the fingers on the front aspect. The vestiges of one common navel are visible at the lower and middle part of the band. When either of the boys was desired to cough, it became evident to the person grasping the band that a ruptured protrusion was forced into the band next the individual who coughed, and a middle shut space of more than an inch remained at the ruptured sacs. These facts are of importance, because in the event of death to one of the twins the life of the remaining brother might be preserved by a prompt and skilful separation of the dead individual. The pulse of the boy on the right side was 87 beats in a minute, that of the one on the left 82. But as they had not before seen a stop watch, and were much agitated by observing its movements, it is probable that moral excitement had some influence on the frequency of

their pulses. Their general aspect was alike, and their teeth of similar character. They were cheerful, apparently in good health, and evidently unaccustomed to petty restraints. There was nothing disgusting or even indecorous in the exhibition of these curious persons, and they do not deserve to be regarded as monsters."

The above report of Sir Anthony Carlisle may be read now with interest. It indicates great shrewdness of diagnosis on his part. He detected not only the cartilaginous connexion, but two of the peritoneal pouches out of the three that have been found since death. He also observed, as did our reporter in 1869, the quickness of the pulse of the brothers, but at the time of his observation the pulse of Eng was four beats faster than that of Chang, while at our observation, forty years later, and when the arterial system of Chang was becoming deteriorated, his (Chang's) pulse was three beats quicker than Eng's per minute.

During their visit on this occasion the boys were exhibited in various ways. On the 26th of April they were advertised to go from St. Katherine's Docks to the Nore in a steamer. They invited the public to join them in this trip, when an opportunity of seeing them more at liberty than in the exhibition rooms would be obtained. Each twin offered to take a partner at a game of whist. The tickets to the steamer were 7*s.* each, with permission to step aboard and ashore free of expense.

After leaving England the twins went to America, and at Athens, Alabama, had a battle-royal with a doctor, for which they were bound over in 350 dols. to keep the peace. It seems that in a room full of visitors, an ardent disciple of Æsculapius expressed a wish to examine the bond of union specially, and, being refused any greater privilege than the others in the room, he called the youths rascally impostors, and sundry other hard names. The brothers forthwith made at the offender and knocked him down. In turn they were themselves assailed with a kettle of hot water, and with chairs and dirks, so that they narrowly escaped with their lives; but as they gave what a Yankee editor of that day called "the primus strokus sine jocus," they were bound over simply to keep the peace in the fine we have named.

In the year 1835, in the latter part of the month of November, the brothers returned to Europe from America. When the boat which brought them from the ship *Resolution* entered the harbour the tide was low, and the youths had, in consequence, to ascend one of the iron ladders of the cross wall. These ladders are merely bars of iron not exceeding twenty inches in length, grooved into the perpendicular face of the quay, yet the twins ascended together with the agility of practised seamen. On the following Tuesday they embarked on board his Majesty's packet *Firefly* for Calais.

We have been asked at what date the twins were married, and whether they were both married at the same time. The facts are these, as we find them stated in a *New York Courier* of 1843. The twins, on returning from Europe about 1836, purchased a plantation in North Carolina. They were married on Thursday, April 13th, 1843, at Wilks Co., N. C., by Elder Colby Sparks, of the Baptist church. They married two sisters, the Misses Sarah and Adelaide Yeates, daughters of Mr. David Yeates, of Wilks Co.

In 1847 they had removed to Mount Airey, where they had settled on a valuable farm which they themselves had purchased. They here, in addition to their native names, assumed the name of Banker, in honour of their banker of that name in the city of New York. The *Biblical Recorder* of 1847 says of them, at this date, that they took much pleasure in farming, had a fine crop, were plain and economical in their dress and manner of living, were fond of hunting, and with their wives and little ones were apparently quite happy and contented. They were punctual in attending the elections, and voted the Whig ticket. In addition to their property in North Carolina, they had invested a fund in New York.

The brothers, bound together and bound also to a comfortable home by the ties of family, remained content for many years. We believe they lost money at last, and thereupon determined to fall back upon the certain rewards of "itinerant exhibition." They made, therefore, another grand tour, and, as we know, revisited England in 1869. The remaining portion of their history has already been told in our pages.

SNAKE-POISON.

THE subject of snake-poison is not one of a purely scientific character, but the importance of determining the nature and properties of a poison which, in India alone, probably destroys over 20,000 human beings annually is obvious, on sanitary grounds, as a matter of humanity. We have called attention on previous occasions to Dr. Fayrer's treatise, entitled "The Thanatophidia of India," which is truly a magnificent work, and since that gentleman's return to England in May, 1872, he has, conjointly with Dr. Lauder Brunton, been engaged in carrying on a series of investigations on the nature and action of snake virus, the results of which have been laid before the Royal Society. Dr. Fayrer, in a Memorandum published in the last Sanitary Blue-book from India, summarises the state of our knowledge up to August, 1873. As the result of his observations in India and experiments on the lower animals in that country, and subsequently in England, aided by Dr. Brunton, with cobra virus sent from Bengal, Dr. Fayrer states that there can be little doubt that in most, if not all, cases of cobra poison, in the human subject at least, the cerebrum is affected, in addition to the motor centres and other portions of the nervous system, for in all cases more or less loss of consciousness resulted before the action of the poison could have induced that condition indirectly through the venosity of the blood resulting from impaired respiration. This has been less obviously the case in the lower animals. It seems fair to conclude that the action of the poison extends to the cerebro-spinal nervous system generally, one or other part of which is affected according to various conditions not absolutely determined, but probably having reference to the quantity or quality of the poison, the seat of its inoculation, and the state of the animal inoculated. That it affects consciousness, the voluntary powers, and the motor centres is indicated by the symptoms manifested in so many human beings who have been bitten; and that the medulla and spinal cord are also implicated is manifested in the experiments performed on animals whose cerebral lobes had been removed previous to inoculation, and by comparisons instituted after death with animals similarly treated in which the poison had not been inoculated; and that the nerve-trunks, their peripheral distribution, and even the muscular fibre itself, are more or less also included in the lethal action of the poison, is demonstrated by the condition of those parts in both warm- and cold-blooded animals. That the vagus is affected is shown by the vomiting which constantly occurs, but whether caused centrically or peripherally is as yet doubtful. The poison injected in several experiments into the jugular vein seemed to act directly on the heart, causing rapid increase of its contractions, until they cease tetanically in systole; but in most cases the heart is not primarily affected, as it has been observed to go on contracting long after respiration has ceased.

The same Blue-book contains, in an appendix, the first two instalments of the reports by the committee in Calcutta, and an interesting report by Mr. Richards on artificial respiration in snake-poisoning, and details of experiments with reputed antidotes, with another by Dr. Wilson, in which he endeavours to show that the different results obtained in Australia and India by the injection of liquor ammoniæ into the veins may be accounted for by the differences in the physiological action of the poison in the two different classes of snakes.

An opportunity of comparing the action of the Australian with the Indian poisonous snakes has been afforded to Dr. Ewart and the members of the committee now investigating the subject of snake-poison in Calcutta. Dr. Halford, of Melbourne, has very kindly sent thirteen tiger snakes (Hoplocephalus curtus) to Calcutta, and twelve of them have arrived in perfect vigour. They are described as being "ferocious little creatures." Some experiments had been made with them to test the activity of their poison and the efficacy of the intravenous injection of liquor ammoniæ. The results, so far, show that the poison is energetic and the ammonia inert. It appears that one-tenth of a grain of the virus killed a large dog in twenty-

three hours, notwithstanding the injection of liquor ammoniæ into the veins. They shed very little poison—not more than a minim could be collected in the shell at a time; but, quantity for quantity, it seems to be little if any less active than that of the cobra or daboia. The symptoms are apparently very similar to those of Indian snake-poisoning. It is observed that constant vomiting is present; and the blood was found partially coagulated in one case after death. Two cases are mentioned in which the liquor ammoniæ was injected into the veins; in one, that of a dog weighing 17 lb., death occurred in one hour and forty-two minutes; in the other, half a grain of the virus was injected into a dog weighing 34 lb., the liquor ammoniæ was injected into the veins, but death was not averted.

The tiger snakes will be carefully kept and fed, in order that investigations may be prosecuted. It would be premature to arrive at any conclusions yet, but so far the physiological action of the poison seems to be the same in the Australian and the Indian snake, and the result of treatment by liquor ammoniæ equally inert. Further experiment will be made, and, when complete, we hope to notice the result. The composition of the committee is a guarantee of the complete reliance that may be placed on the scientific value of its report.

THE ASHANTEE WAR.

HONOURS AND REWARDS FOR THE MEDICAL SERVICES.

WE have to congratulate the medical officers on their having obtained the following well-earned distinctions and rewards:—

The Queen has been graciously pleased to give orders for the following promotions in and appointments to the Most Honourable Order of the Bath.

Deputy Surg.-Gen. Anthony Dickson Home, C.B., V.C., to be Ordinary Member of the Military Division of the Second Class, or Knight Commander of the said Most Honourable Order. Staff-Surg. Ahmuty Irwin, R.N.; Surgeon-Major Thomas Macdougall Bleckley, M.D.; Staff-Surg. Henry Fegan, M.D., R.N.; Surgeon-Major Robert William Jackson; Surgeon-Major Charles Benjamin Mosse, African Medical Service;—to be Ordinary Members of the Military Division of the Third Class, or Companions of the said Most Honourable Order.

ADMIRALTY.—The following promotions have been made for services rendered during the recent Ashantee Campaign:—Staff-Surg. (Second Class) Henry Fegan, M.D., to be Staff-Surgeon in Her Majesty's Fleet, with the seniority of the 28th March; Staff-Surgeons John Watt Reid (b), M.D., and Ahmuty Irwin to be Deputy Inspectors-General of Hospitals and Fleets; Staff-Surgeons (Second Class) Richard Eustace, Thomas Colan, M.D., and Francis Hamilton Moore, to be Staff-Surgeons in Her Majesty's Fleet; Surgeons Archibald Grant Colquhoun and James William Fisher, M.D., to be Staff-Surgeons (Second Class) in Her Majesty's Fleet.

WAR OFFICE (MEDICAL DEPARTMENT).—Surg.-Major William Alexander Mackinnon, C.B., to be Deputy Surgeon-General; Surg.-Major John Andrew Woolfreyes, M.D., to be Deputy Surgeon-General; Surg. George William McNalty to be Surgeon-Major.

SANITARY ADMINISTRATION.

To the Editor of THE LANCET.

SIR,—I am much obliged to you for a criticism, which, though somewhat hostile, is nevertheless perfectly courteous, and to which I rely on your candour to allow me at once to reply.

You have, as heretofore, fully shown the confusion of Mr. Stansfeld's notions, arising, as I agree with you, mainly from "deeper causes than mere divergences of opinion." But you differ with me in not tracing those causes to the machinery of the Public Health Act, founded on the report of the Royal Commission. I do not for a moment suppose that you mean that the administration of an Act has nothing to do with the machinery by which it is administered; nor, I imagine, would you deny that the machinery of this Act is constructed on the lines laid down by the Sanitary Commission. This, at all events, was plainly professed by Mr. Stansfeld, and acknowledged by Sir C. Adderley, and it was the avowed reason of their uniting to pass the Act of 1872. I do not, therefore, understand why you should expect me or anyone else who has taken part in the controversy from the first, to "keep these two questions apart." Surely, it would be unscientific, in therapeutic medicine, to treat the symptoms of a serious chronic disease without reference to its constitutional or determining causes. Surely these may be thoroughly inquired into, and their connexion with the disease clearly proved, without the physician being accused of "confounding two very distinct questions."

As regards the local arrangements which you so properly describe as having been unwisely, if not ignorantly, promoted by Mr. Stansfeld and his inspectors, you cannot deny that their hands were tied by the Act. The Local Government Board was not at liberty to determine, absolutely, arrangements which might secure a combination of (1) minute local inspection with (2) scientific advice and direction over large and well-contrived areas. The former requires the official aid of the medical attendants on the poor; the latter is incompatible with "minute local inspection," unless this be performed by those local officers as assistants. The former, in rural districts, may now be done legally by the union medical officers; and boards of guardians, as rural authorities, are to appoint each its own officer or officers. The latter can only be done effectively under an authority which the Act does not create, and which the Local Government Board is not empowered to constitute.

I repeat, then, that to blame Mr. Stansfeld for not performing, or to expect Mr. Sclater-Booth to perform, impossibilities is not reasonable. The many little local boards throughout the country will continue to assert, as they have in hundreds of instances asserted, their legal right to make separate and independent appointments, and to refuse co-operation with neighbouring or surrounding authorities, without which co-operation every one (Mr. Stansfeld included) now knows that effective administration is out of the question. Hence, Mr. Stansfeld's Select Committee of 1873, which ought to have ended in a Boundary Commission (see Dr. Farr's evidence); hence, also, Mr. Henley's suggestion of combined districts under central committees. But all would be unavailing without legal powers to combine local authorities of both kinds for special objects, and to adjust the boundaries of unions, local board districts, boroughs, and counties.

This indispensable reform has hitherto been steadfastly refused. Now let the medical press boldly and unanimously demand it, and it may be granted. Then will the greatest difficulty in the way of correct sanitary administration be removed, as I showed at length in my address eight months ago, "On the Working of the Public Health Acts."

I admit most unreservedly that one very serious error is due specially to Mr. Stansfeld, apart from the causes of failure which I have mentioned,—namely, the virtual elimination of the Medical Department of the Local Government Board from all effective control of arrangements, concerning which Mr. Simon and his inspectors are the only competent judges. This might not have been intended by the Sanitary Commission, but their report lacks any definite instructions as to the action of the Medical Department. But not even Mr. Simon, fully empowered to revise all medical arrangements, could, under the present Act, prevent the most absurd results of local board management.

The question then again stands prominently forth, Can we obtain amended legislation founded on the report of a good Boundary Commission? Will the medical journals aid an effort to secure it?

Your obedient servant,

Cheltenham, March 16th, 1874. H. W. RUMSEY.

*** We willingly give a place to Mr. Rumsey's letter, and can assure him that our observations in THE LANCET of the 14th ult. were not dictated by any spirit of hostility. Dr. Rumsey misapprehends the position we have taken, and we trust to make that misapprehension clear. We judged Mr. Stansfeld from the point of view of the Royal Sanitary Commission's report, and we maintain that even from this aspect—the most favourable to him—he failed. We have given the Royal Sanitary Commission credit for having re-

commended that the different technical staffs formerly attached to the Privy Council Office and Home Office should be attached to the new Board for a definite purpose, and that that purpose was the utilisation of their particular knowledge and experience under circumstances which would make it more available for the public good. These staffs were altogether ignored by Mr. Stansfeld, and the only chance of obtaining such good as lay in the Public Health Act, 1872, and in the recommendations of the Royal Sanitary Commission, was lost. *Dilettante* knowledge was substituted for technical knowledge in the administration of the Public Health Act, 1872, and no one can know better than Dr. Rumsey the unfortunate results of this substitution, and how greatly they must complicate future sanitary work, legislative and administrative. The Public Health Act, 1872, still remains law; the system of administration adopted by Mr. Stansfeld still remains in force; and Mr. Sclater-Booth, as Mr. Stansfeld, will no doubt be guided in his duties by the conclusions of the Royal Sanitary Commission. Is it of no importance to the profession that Mr. Sclater-Booth should call to himself better counsels in the administration of the Act and the interpretation of the conclusions of the Royal Sanitary Commission than Mr. Stansfeld did? We do not think that Dr. Rumsey will say no. If bad is not to become worse, Mr. Sclater-Booth must have different counsels than Mr. Stansfeld; and Dr. Rumsey is in accord with ourselves and with the profession at large in the opinion that among those counsels the rehabilitation of Mr. Simon's influence is a foremost consideration. Such being the facts of the case, and so long as the law continues as it is, we hold it of essential importance not to lose sight of the facts and of the working of the law pending the ulterior radical changes Dr. Rumsey seeks for. We shall welcome any enlightenment from Dr. Rumsey on the intimate pathology of the Public Health Act, 1872, but meanwhile we must not forget that the Act remains the same while the doctors are changed. The incoming doctor is bound to accept the Act as he finds it, but he may not necessarily be bound to carry out the same system of treatment as his predecessor. The question of the treatment adopted by Mr. Stansfeld, as of the treatment to be adopted by Mr. Sclater-Booth, is, we still think, best kept apart from the questions raised by Dr. Rumsey; while at the same time we concur with him in seeking for an amended legislation.—ED. L.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF COMMONS.

MARCH 27TH.

IMPORTATION OF ADULTERATED ARTICLES.

MR. MUNDELLA asked the Secretary of the Local Government Board what steps were being taken to prevent the importation of adulterated articles of food into this country, and to relieve honest traders from their liability to conviction, under the Act of last year, for the sale of articles adulterated by the foreign producer, and on which Customs duties had been paid.

Mr. SCLATER-BOOTH, in reply, said the subject had been much under his consideration, and only to-day a deputation had waited upon a member of the Government. Would the hon. member (Mr. Mundella) repeat his question after Easter.

CATTLE DISEASE (IRELAND).

Sir M. H. BEACH obtained leave to bring in a Bill to amend the Acts relating to cattle disease in Ireland.

PUBLIC HEALTH (IRELAND).

Sir M. H. BEACH obtained leave to bring in a Bill to amend the law relating to public health in Ireland.

PUBLIC HEALTH (SCOTLAND) BILL.

In reply to Sir W. ANSTRUTHER,

Mr. CROSS said he was happy to say that the Government were considering the matter, and he was in communication with the Lord Advocate on the subject.

MARCH 30TH.

SEWERS AT GREEN PARK.

Colonel HOGG, in response to Lord C. HAMILTON, stated that the main sewer running under Piccadilly into Green Park, which was in such a defective condition that it was complained of as a nuisance, was under the jurisdiction of the vestry of St. George's, Hanover-square. He had called the attention of the vestry to the matter with a view to the abatement of the nuisance.

THE ASHANTEE WAR.

Dr. LUSH expressed his regret that the body of officers whose duty it had been to take care of the health of the troops engaged in that expedition, and whose services were unusually important on that occasion, had been in no way mentioned either in that vote of thanks or in the speech of the Prime Minister. It appeared to him that the medical officers in that expedition had a special claim to consideration; and although it might have been contrary to etiquette to mention them specially, yet he ventured to think that was not an adequate reason for omitting to notice them. It was well known that on the medical policy adopted in an enterprise on that coast the power of the troops to withstand the dangers of the climate, and thus to go successfully through their work, vitally depended.

Mr. HARDY, in reply, said that it would have been out of place to mention the medical officers in the vote, inasmuch as other officers of the same rank were not named in it. The thanks of the House were given to all "the other officers of the navy, army, and royal marines who have taken part in the operations on the Gold Coast"—terms which would embrace both the combatant and the medical officers. The rule was not to mention an officer by name unless he had held a command in the field, and it would be remarked that all who were named had been in command. He certainly did not wish to depreciate the services of the medical officers, which were most important, but some of the most distinguished officers who had taken part in the late expedition were left out by the rule on which it was usual to act in those cases. No one had read with greater pride and pleasure than he had done some of the reports on the medical officers, which reflected the greatest possible honour on them and on the service to which they belonged.

THE BENGAL FAMINE.

Lord G. HAMILTON, in reply to a question, said the preparations on the part of the Indian Government to meet the scarcity in Bengal were not based merely on the wants of exceptional districts, but on the total number of the population in Bengal likely to stand in need of relief. The districts mentioned in the question were consequently included within the scope of the measures taken.

THE LATE DR. LIVINGSTONE.

Mr. RUSSELL GURNEY drew attention to the expected arrival of the body of Dr. Livingstone, and to the fact that, though the authorities of Westminster Abbey were willing to give his remains a last resting place there, neither his family nor the Geographical Society—to which application had been made—had any funds available for the purpose. Under these circumstances, he appealed to the Government to make some provision for Dr. Livingstone's funeral in the Abbey, feeling confident that the House and the country would cheerfully acquiesce in any expense which might be necessary.

Mr. DISRAELI replied that there could be but one feeling as to Dr. Livingstone's great claims on the country, and the respect which was due to his memory. But in matters of this kind many circumstances required consideration, for which, owing to the short notice, there had been no opportunity. The fact that Dr. Livingstone's body was being brought home at the expense of the country showed that the Government was not deficient in respect to his memory. He asked the House, therefore, to allow the Government to take note of this conversation and to give it their best consideration.

Medical News.

APOTHECARIES' HALL. — The following gentlemen passed their examination in the Science and Practice of Medicine and received certificates to practise on March 26th:—

Bookey, Thomas Leeson, Whitchurch, Salop.
Coffin, Richard James Maitland, Malta.
Hogg, James, Dronefield, Sheffield.
Hogg, Tom Bellshaw, Leeds.
Thomson, Samuel John, St. Mary's Hospital.
Wilding, Leonard James, Worcester.

The following gentlemen passed their Primary Professional Examination on the same day:—

Edwin Barnes and Arthur Pearce, St. Bartholomew's Hospital; John Burton Rudduck, London Hospital.

PRESENTATION.—On the 19th ult., the friends of George O'Connor, Esq., M.B., of Ballycastle, presented him with an address, handsome timepiece, and a purse of sovereigns as a token of esteem for his character, and of appreciation of his professional abilities.

DR. STEEVENS'S HOSPITAL, DUBLIN.—On Saturday, the 28th March, the annual *conversazione* given by the medical committee of this institution took place, the board-room and supper-room being tastefully decorated for the occasion. There was a numerous attendance of visitors. A variety of scientific instruments and microscopic preparations were exhibited, and a number of scientific experiments of an interesting character were demonstrated to those present. The Cusack medals were distributed during the evening.

BEQUESTS TO MEDICAL CHARITIES. — Mr. Job Hindley bequeathed £1000 to the Manchester Infirmary, £500 to the Barnes Convalescent Home, £350 to St. Mary's Hospital, Manchester, £250 to the Southport Convalescent Home, and £250 each to the Eye Hospital and Lock Hospital, Manchester.

Medical Appointments.

ADJOHN, Mr. R., has been appointed Public Analyst for Cambridgeshire: £5 5s. per annum, and fees.

ASHWORTH, J. H., L.R.C.P.Ed., L.F.P. & S. Glas., has been appointed Medical Officer for No. 3 Deeping St. Nicholas District of the Spalding Union, vice Burn, deceased.

BISHOP, Mr. G. H., has been appointed Junior Resident Medical Officer to the Female Lock Hospital, Westbourne-green, vice Liddledale, promoted to Senior.

BUTLER, E. F., L.K.Q.C.P.I., L.R.C.S.I., has been appointed Medical Officer for the Walton District of the Woodbridge Union, Suffolk, vice Ruckley, resigned.

CAMERON, Mr. J., of the Andersonian University, Glasgow, has been appointed Medical Officer and Public Vaccinator for the Sunart, Ardnamurchan, and Moidart Districts of the Parish of Ardnamurchan, Argyleshire.

COOPER, Sir H., M.D., F.R.C.P.L., has been appointed Consulting Physician to the Hull and Sculcoates Dispensary, on resigning as a Physician.

DAVIES, D. A., M.R.C.S.E., has been appointed a House-Physician to the Queen's Hospital, Birmingham.

EAGLE, H. F. C., M.R.C.S.E., has been appointed a Surgeon to the Queen Adelaide Dispensary, Bethnal-green-road.

HARRISON, S. N., L.R.C.P.Ed., M.R.C.S.E., has been appointed Medical Officer for the Aldborough District of the Skirlaugh Union.

JONES, T., M.B., M.R.C.S.E., has been appointed Operating Surgeon to the General Hospital and Dispensary for Sick Children, Pendlebury, Manchester.

KIRK, W., jun., M.R.C.S.E., has been appointed Medical Officer and Public Vaccinator for the Sproatley (late Humbleton) District of the Skirlaugh Union, vice Cautley, deceased.

LEITCH, J., M.B., C.M., has been appointed Visiting Medical Officer to the Cumberland and Westmoreland Convalescent Institution, Silloth, vice Bindon.

M'BRIDE, C., M.B., C.M., has been appointed House-Surgeon to the Queen's Hospital, Birmingham.

MARTIN, B. R., M.B., has been appointed Medical Officer, Public Vaccinator, and Registrar of Births &c., for the Ballybay Dispensary District of the Castleblayney Union, Co. Monaghan, vice Percy, resigned.

MESSITER, M. A., M.R.C.S.E., has been appointed Resident Medical Officer to the Birmingham and Midland Free Hospital for Sick Children, vice Dodson, deceased.

MOLONY, P. J., B.A., M.D., has been appointed Medical Officer and Public Vaccinator for the Chesterton District of the Chesterton Union, Cambridgeshire, vice Beck, whose term of office had expired.

PHILLIPS, J., M.R.C.S.E., has been appointed Medical Officer for No. 1 District and the Workhouse of the Narberth Union, Pembrokeshire, vice Bush, resigned.

RUDDY, G. C., L.R.C.P.Ed., M.R.C.S.E., has been appointed Medical Officer for the Chorley Union Workhouse, vice Tobin, resigned.

SADD, F. G., M.R.C.S.E., has been appointed Medical Officer for the Rugby District and the Workhouse of the Rugby Union, vice Torrance, resigned.

SMITH, J. B., M.B., has been appointed a House-Physician to the Queen's Hospital, Birmingham.

TURNER, A. C., L.R.C.P.L., M.R.C.S.E., has been appointed Medical Officer and Public Vaccinator for No. 1 District, and Medical Officer for the Workhouse of the St. Neots Union, vice Rix, resigned.

WHITWORTH, H., M.D., has been appointed Medical Officer and Public Vaccinator for the St. Agnes District of the Truro Union, vice Lambrick, resigned.

WIGGIN, J., F.C.S., has been appointed Public Analyst for the Eastern Division of Suffolk: 10s. 6d. per analysis.

WILSON, W. S., L.R.C.P.L., M.R.C.S.E., has been appointed Resident Medical Officer to the Bloomsbury Dispensary, vice Humphreys, resigned.

[In the following list—under the Public Heath Act, 1872—the letters "P.S.D." signify Port Sanitary District, "R.S.D." Rural Sanitary District, and "U.S.D." Urban Sanitary District.]

Districts, and Medical Officers.			*Salary per ann.*	*Area in Acres.*	*Population.*
Andover, R.S.D.—Mr. Septimus B. Farr			—*	—	—
Canterbury, U.S.D.—Mr. Henry E. Hutchings			£60 for 3 yrs.	400	20962
Edmonton, U.S.D.—Dr. Frank Reid			£30	7400	13859
Ely, R.S.D.—viz.:					
Littleport Sub-district—		Mr. Chas. T. Ennals	£5 5s.	17015	3903
Haddenham	"	Mr. Henry Nichol	£5 5s.	20328	4102
Sutton	"	Mr. Wm. J. Merlin	£5 5s.	16170	3318
Downham	"	Mr. John Muriel	£3 3s.	10550	2201
Witchford	"	Mr. G. M. Sinclair	£2 2s.	2880	894
Hyde, U.S.D.—Mr. Samuel Beecroft			£30	—	18000
Idle, U.S.D.—Mr. John P. Aston			£40	2160	6253
Llanfyllin, R.S.D.—viz.:					
Llanfair Sub-district—		Mr. Wm. W. Evans	—†	44297	6668
Lowestoft, P.S.D.			£20	—	—
Lowestoft, U.S.D.		Dr. Edward Jeffery	£60	1673	15246
Mutford & Lothingland, R.S.D.			£50	28074	9465
Monk Bretton, U.S.D.—Mr. John Blackburn			£5	2050	2090
Newbiggin-by-the-Sea, U.S.D.—Dr. John C. Reid			£30	335	1139
Newington, U.S.D.—Mr. John F. Holden			—‡	1350	2500
Northallerton, U.S.D.—Mr. James B. Peacock			£30	99	2063
Ramsey, U.S.D.—Mr. Wm. Few			£21	16000	4700
Retford West, U.S.D.—Dr. Geo. T. Saville			£2 2s.	930	650
Ryde, U.S.D.—Dr. Alfred G. P. Wilks			£80	—	12000
Sevenoaks, R.S.D.		Dr. Chas. O. Baylis	£100	57116	19034
Sevenoaks, U.S.D.			£30	3747	4250
Shrewsbury, U.S.D.—Dr. Wm. N. Thursfield			—	5600	23300
Snelston, U.S.D.—Mr. John Ellam			£40	730	12237
Southend, U.S.D.—Mr. Edward E. Phillips			£5 5s.	2600	3000
Stowmarket, U.S.D.—Mr. John W. Harper			£10 10s.	922	4025
Swaffham, U.S.D.—Mr. Robt. N. Emerson			£30	7017	9700
Wareham and Purbeck, R.S.D.—viz.:					
Bere Regis Sub-district—		Mr. Francis D. Lys	Not fixed	19782	3243
Corfe Castle	"	Dr. W. E. Humble		12804	2342
Morden	"	Mr. Chas. Willcox		11447	1563
Swanage	"	Mr. De la Motte		13872	3046
Wareham No. 1	"	Mr. Chas. Willcox		7379	2565
" 2	"	Mr. W. Daniel		14713	1692
Wrotham, U.S.D.—Mr. John C. Kent			£15	7987	3201

Births, Marriages, and Deaths.

BIRTHS.

CHIENE.—On the 25th ult., at Castle-street, Edinburgh, the wife of John Chiene, M.D., of a son.

JAMESON.—On the 28th ult., at West Cromwell-road, Kensington, the wife of T. Jameson, M.D., R.N., of a son.

MACKAY.—On the 24th ult., at Palmfield House, Crook, the wife of A. Mackay, M.B., C.M., of a son.

MILLER.—On the 26th ult., at Edith-grove, Fulham-road, the wife of C. M. M. Miller, M.D., Surgeon-Major Army, of a son.

STAINES.—On the 26th ult., at Southampton-row, the wife of J. F. Staines, L.R.C.P.Ed., of a son.

THURSTON.—On the 30th ult., at Ashford, Kent, the wife of Edward Whitfield Thurston, Surgeon, of a son, still-born.

MARRIAGES.

BIGGS—MUNRO.—On the 25th ult., at St. Mary's, Bathwick, Bath, H. G. Biggs, L.R.C.P.Ed., M.R.C.S.E., to Jane Irene, daughter of G. A. Munro, Esq.

ROBINSON—WHITELEY.—On the 28th ult., at St. Thomas's Church, Melbourne-street, Richard Edward Robinson, L.S.A.L., only son of Rich. Robinson, Esq., of Leeds, to Mary Ann (Annie), eldest daughter of Thos. Morgan Whiteley, of Hartshead, and niece of the late Mrs. Otley, of Leeds.—No Cards.

DEATHS.

ANDREWS.—On the 28th ult., at Brabourne, near Ashford, Kent, Onslow Andrews (father of Onslow Andrews, M.D., Alfred B. Andrews, M.R.C.S., and Henry Charles Andrews, M.D.), in his 83rd year.

CLARKE.—On the 27th ult., James Clarke, L.R.C.P.Ed., of Dunleer, Co. Louth.

CROWTHER.—On the 26th ult. (at the residence of his brother, Dr. Crowther, of Hamby Hall, Alford, Lincolnshire), Wm. Edwin Crowther, M.R.C.S.E., L.S.A. (third son of the Hon. W. L. Crowther, of Hobart Town, Tasmania), aged 24.

DANIELL.—On the 28th ult., at Park-street, Grosvenor-square, Cyrus O. Daniell, M.D., Surgeon-Major Bengal Army.

DAVIES.—On the 28th ult., Ernest Bowen, infant son of W. Bowen Davies, of Llandrindod Wells, Radnorshire.

RAYNER.—On the 24th ult., Edward Rayner, M.D., of Rue Trakier, Paris, aged 60.

TORRANCE.—On the 26th ult., at Rugby, Dr. Torrance, aged 76.

* £10 for one year, and 21s. for each visit required to be made.
† £30 till the 24th of June. ‡ £5 5s., and usual professional charges.

Notes, Short Comments, and Answers to Correspondents.

PAUPERISM IN SCOTLAND.

FOR the last year or two pauperism has been on the wane north of the Tweed, both as to expense and numbers. The outlay on the relief of the regular poor in the year ending 14th March, 1873, was much less than in any of the four preceding years—the decrease being unbroken since 1869. On the cost of the casual poor the decrease is proportionally much greater during the same interval. It is about 12 per cent., shows the same steadiness of decline, and has now reached the lowest point hitherto known. Expenditure for management, law, buildings, and so forth, declined during the same period, with the exception of last year, when the increase, owing to an undue share for the cost of new buildings being thrown on that year's revenue, was considerable. The registered or regular poor last year were fewer than for ten years, and the number of the casual poor the smallest known since the beginning of the present system. Their reduction in cost and number in the pauper department has not been effected by pinching or parsimony—the average allowance to each pauper last year being greater than ever before, and about 20 per cent. greater than the allowance of ten years ago.

Surgeon-General Roth (Dresden) is thanked for his letter; but the obituary has not come to hand.

Mr. Henry F. May should read our advertising columns.

MEDICAL EDUCATION.

To the Editor of THE LANCET.

SIR,—I read with much interest some time since in your columns reports of a lecture or two by Dr. Harvey, of Aberdeen University, referring to medical education. I cordially endorsed the greater part of his opinions and statements, and I think the profession should be encouraged to proceed with his good work of altering or circumscribing, condensing, and contracting the significant proportions which many works of late years have assumed on the various branches of the medical and collateral sciences, as required by examining boards, and with which the medical student is expected now to make himself familiar. Take, for instance, Medical Jurisprudence. I was the other day requested by a student to give my opinion as to the best work on this subject for his study, and as to how much was considered essential for him to become acquainted with. My reply was, "I do not know what the examining boards may require of you; but I believe the essentials of the subject may be put into about fifty pages octavo." I naturally hesitated to recommend Dr. Taylor's work on this subject, which has of late years assumed such gigantic proportions. Toxicology, also, is another ponderous volume which I believe the student is expected to wade through. I accordingly, on the spur of the moment, recommended Dr. Guy's Forensic Medicine as being somewhat more concise and readable, though not sufficiently so by a long way in my opinion. I do not mean any disrespect—far from it—to the authors of these works. But, I would ask, where can be the utility to the student in spending his valuable time, which could be much better employed, in studying such works as these when, I will undertake to say, the essentials of the subject could be written in a work of fifty pages? As works of reference to the practitioner and jurist, and to the student in after life, they may be, and doubtless are, useful enough; but I think that even for this purpose a contracting influence would be a decided advantage.

The late Professor Syme was the only man, as far as I know, who had the courage and good sense to begin to curtail rather than expand and enlarge—so to speak, to clean out his Augean stable in successive editions of his Principles of Surgery.

I hope I shall not be misunderstood, or be thought to speak too strongly. I do not mean to imply that a great part of these excellent works is to be considered as absolutely useless and valueless; but I do mean to say that the late Professor Syme's example should be in many instances rather extensively followed, and that some more concise editions (especially on Medical Jurisprudence) should be available for the student, and it would prove a very great advantage to this class especially if they could be obtained. The medical student should be well instructed in those branches which form the basis of his professional knowledge, and only then will he be able to form or give any opinion satisfactorily in a court of justice on any case which may occur in his future career, and then, if necessary, these larger works are available for reference.

Sir, I make these observations in the interest of the medical students; may or may not be of those whose occupation consists in book-making.

Your obedient servant,

Liverpool, Feb. 23rd, 1874. FREDK. W. RICKETTS.

Philanthropist, (Stoke Newington.) — The British Asylum for Deaf and Dumb Females is situated at Lower Clapton. We believe there will be an election of inmates some time in June next.

Dr. Gowers' paper shall be published next week.

THE ADMINISTRATION OF CHLORAL IN THE FIRST STAGE OF LABOUR.

To the Editor of THE LANCET.

SIR,—Having read the recent communications in THE LANCET on the Administration of Chloral in Labour, I write to ask whether anyone can corroborate me as to its peculiar efficacy in primiparous cases, where the first stage is a long one, and the pains are so wearying in character that they tend to exhaust the patient without adequately compensating for the exhaustion they produce. I have given two scruples of chloral, which generally produces sleep; if not, have followed it up by a second dose of one scruple three hours after the first, with beneficial results, the patient not only being refreshed, but the pains altering, assuming the forcing character of the second stage.

I am, Sir, yours, &c.,

Upwell, March 24th, 1874. WALTER BERRY.

CAN ONE MAN BE A SOCIETY?

THIS question is raised often now in the cases in which an individual medical man calls himself a Society or a Dispensary. There be many now-a-days who set up for being dispensaries. Sometimes they have no qualification. The word dispensary is sometimes used in such cases, because, while having a medical sound, it does not violate the Medical Act. A handbill is before us, headed Cambridge and Chesterton Medical Provident Society, in which the only name which appears is that of "Dr. Molony, Chesterton-road." We do not discuss the taste of such a handbill as a means of acquiring practice. That question does not admit of discussion. But we direct attention to the curiosity of a Society consisting of one man.

Batavian, (Erith.)—The two English surgeons with the Dutch expedition in Sumatra are Dr. Charles Mayo and Mr. John C. Galton.

THE COCOA QUESTION.

To the Editor of THE LANCET.

SIR,—In the paper recently read before the Society of Arts by Mr. Holm, we are surprised to find that he reiterated the same arguments as to the *necessity* for adding starches to cocoa. These mixtures are, no doubt, wholesome, provided they are thoroughly boiled; otherwise (as was clearly shown by Mr. Bartlett, who spoke on Mr. Holm's paper) they are not digestible, this being frequently the cause of "soluble cocoa" disagreeing with delicate and dyspeptic persons. But there are much more important subjects involved in this portion of the question. Cocoa, as Mr. Holm himself showed, contains about 20 per cent. of albuminoid constituents, and he adds: "These are classed amongst the nitrogenous principles of food, and *their presence renders cocoa one of the richest flesh-formers we have.*" It will, therefore, be seen that every pound of starch or sugar added (both being heat-givers, and not containing any nitrogenous element) will reduce its value as food in the same ratio. The most important constituent of cocoa—that which constitutes its stimulating and refreshing element—is theobromine or the alkaloid principle, on which Mr. Holm remarks: "In regard to these alkaloids it is interesting to note that throughout the world the instinct of man has led him to seek some substance which contains one of these principles, which owe their value to the specific influence they exert on the nervous system, stimulating it, and checking waste of tissue." It will again be seen that the proportion of this important constituent is reduced in exact ratio to the amount of starch and sugar added. It would be as sensible to add starch to tea and coffee as to add it to cocoa, except for the plea that such addition renders cocoa more easily miscible. Progress in science and mechanism has rendered this antiquated plea unnecessary; for by expressing the *excess* of butter from the cocoa, as we do in preparing our cocoa essence, the necessity of adding starch is dispensed with, and consequently the proportion of nitrogenous and alkaloid principles is *considerably increased* instead of being diminished. The abstraction of a portion of the butter renders cocoa easily miscible, and is not only much more valuable in a dietetic point of view, but is far more refreshing, and delicious in flavour and aroma.

The assertion that has been made, that the extraction of the butter from cocoa "is analogous to the abstracting of cream from milk," is incorrect in *fact* and in the *idea* it *conveys*, because *the whole of the butter is never abstracted* in the manufacture of genuine soluble cocoa. The addition of starch to attain the same result (viz., suspension in the cup) reduces the proportion of cocoa butter to the same extent as by the *extraction* of the butter:—

Cocoa Essence contains:		Best Homœopathic Cocoa contains:	
Cocoa-butter	19·22	Starch and sugar added... ...	53·00
Albumen and other component parts of cocoa	80·78	Cocoa-butter	20·15
		Albumen and other component parts of cocoa	26·85
	100·00		100·00

The proportions of cocoa-butter given in these tables are from Dr. Muter's analyses.

Cocoa-butter is both nourishing and wholesome; but owing to the large proportion (50 per cent.) that cocoa contains, the addition of starch renders it an emulsion that may fairly be compared to melted butter, which is likely to disagree with many constitutions, and cannot be *refreshing* as a beverage should be.

Yours, &c.,

March, 1874. CADBURY AND CO.

X. L., (Birmingham.)—Our correspondent might obtain a few valuable hints for the purpose of his inquiries by perusing some observations by Czerny and Latschenberger, published in Virchow's Archiv, Band lix., Heft ii., on a remarkable case of hernia. In this case nine inches of the large intestine were exposed, and afforded opportunity for the trial of various experiments in regard to the process of absorption by the intestine.

QUANTITATIVE ANALYSIS RESPECTING TANNIN.

To the Editor of THE LANCET.

SIR,—In your last issue you give a new method of estimating tannic acid devised by M. Dumas. May I take the liberty of correcting the idea expressed in your short account of the method. You give as the result—Acacia pods, 40 per cent. of tannin, whereas according to Wagner (among other authorities) they contain 14 to 20 per cent. of tannin. Chesnuts are said to contain 60 per cent. of tannin; they really contain 2 to 4 per cent. Oak-bark, according to this method, contains 76 per cent. of tannin. It would be an immense boon to tanners if this species of oak could be acclimatised here; for our English oak-bark only contains 10 to 15 per cent. of tannin. The fact really is that M. Dumas' method estimates all the oxidisable matter as well as the tannin; thus he includes the gallic acid. This is really only a change from Lowenthal's method with permanganate.

In a paper written by me in the *Chemical News* a few weeks ago, I detailed a method, which works very well, of estimating the quantity of tannic acid, even when in presence of other oxidisable matter, such as gallic acid &c.

I am, Sir, yours obediently,

C. ESTCOURT, F.C.S.,
Public Analyst to the City of Manchester.

Borough Laboratory, Manchester, March 30th, 1874.

"CUTTING DOWN TYPHUS AND TYPHOID."

AT a late meeting of the Lambeth Guardians the following letter from Mr. T. P. Lucas, M.R.C.S., of Westminster-bridge-road, who had been in attendance on a workhouse official, was read:—

"I was called in to attend Mr. Laffin, and found him in such a high state of fever &c., that I was afraid he was going to have typhus or typhoid. Happily, however, under treatment the symptoms resolved themselves into simple or febricula; hence my first certificate. The fever left him exceedingly low, and suffering from a weak stomach and sluggish liver; hence my second certificate. Respecting the rapidity of the convalescence, I am happy to say that I succeed equally rapidly with all fever patients, cutting typhus down in a few days, and typhoid equally as quick, as Dr. Clapton, of St. Thomas's, can testify."

The letter appears to have had a powerful effect on the worthy guardians, one of whom was so struck with the great truths contained in it that he proposed it should be widely reported. Another opined "that Mr. Lucas would make a good officer for a fever hospital." It is a pity that the new method of treating fever, which is so lucidly and modestly advanced by Mr. Lucas in his letter, should not be made known to the profession, who would gladly welcome any addition to their armament capable of "cutting down" zymotic disease. Perhaps the panacea is equally applicable to such conditions of the human system as apoplexy, stone in the bladder, &c.

Sportsman.—The "Secret of Long Life," by Mortimer Collins, and "Longevity," by Dr. John Gardner, both published by Henry S. King & Co.

"WHAT IS MALARIA?"

To the Editor of THE LANCET.

SIR,—In your journal of the 13th December, 1873, you express some doubts as to the completeness of my solution of that vexed question, "What is malaria?" I have no hesitation, however, in saying that any point which may appear at all uncertain can be satisfactorily explained. It is gratifying to find that you agree with me so far as to say: "One practical fact remains, however, on any view—viz., that the protection of the body against 'chill' is of the first importance in places where aguish diseases are rife, and of equal importance is good food and plenty of it." The truth of this will be disputed by no one who has had any experience of such localities. But why, unless chill is the cause of those disorders, should protection from it be of so much importance? As the most ardent champions of "malaria" admit that no research has been able to detect the existence of any such poison, the case at present stands thus:—

1. Nightly chill is a marked feature in malarious localities.
2. No malaria or other poison can be detected there.
3. The preservation of animal heat is the most important safeguard against the evil influence which haunts such places. In short, protection from chill is protection from ague and its allied disorders.

When, in addition to this, case after case has been quoted in which the rapid abstraction of heat from the body has produced attacks of paroxysmal fever, under the most varied circumstances of site, soil, and atmospheric conditions, what more remains to be proved? If additional instances of this disease having arisen from exposure to climatic vicissitudes be required they can be adduced in almost endless numbers. It has been asked, Why does not every chill produce ague? But why should it? Every exposure to cold does not result in bronchitis. On the other hand, it is said that cases of ague sometimes occur without chill. No proof of this, however, is offered. I have never inquired closely into a case of intermittent without being able to trace it to this cause. True, the degree of chill in some cases has been very slight; but I have shown, and will presently point out again, that under certain conditions a very trifling loss of heat may be sufficient to produce this effect. Thus in India, in the hot season, an attack of fever is often caused by exposure to the current of air from a punkah, thermantidote, or an open door; or by a bath in water a few degrees cooler than the atmosphere. From what is known of "malarious" localities, it must be evident that at night, which is the time of danger, chill is inevitable unless the body be well protected by clothing, shelter, or fire. When these places become warm, "malaria" no longer lurks in them. While the sun shines, the most deadly swamp is harmless.

With regard to Surgeon-General Maclean's objections to my views, to which you advert as indicating the weak points of the "chill theory," they are thus stated by himself in *The Times*:—

"Why do we not suffer from agues and their sequels whenever we are exposed to alternations of temperature, to heat by day, and 'chill' by night?

"Why must we go to the marshes of Italy, the jungles of India, the 'bush' of the West Coast of Africa, and such like localities, before 'chill' can produce the class of fevers known from the earliest times to be generated in such places, if there be not a poison given off by the soil, to which, for want of a better name, we give that of malaria?

"Who that has served or lived in such regions is not familiar with this remarkable type of fever, with its singular stamp of periodicity familiar to the most unlearned in unhealthy climates, with the long catalogue of sequels in the shape of enlarged spleens and livers, broken-down constitutions, and emaciated frames, such as are to be seen in our wards at Netley, and in other hospitals set apart for the reception of sick from hot climates, and only there? Why, in a country where 'chills' and fevers of other types abound, are not the hospitals of London filled with men similarly affected?

"Time was when malaria was as rife in England as it is now in the Pontine marshes or the delta of the Ganges, and the fevers it causes were as well known as they are now in the regions named. What has become of this poison now? Is it not that by a higher civilisation we have turned the productive energies of the soil to a better purpose than the genesis of a poison to which, as I have said, for want of a better name we have given that of malaria?"

A reference to my work on this subject will show that these objections have been there anticipated, and fully met (see Chapters III., XI., XII., XV., and XVII.). They have been answered, too, elsewhere. As you have, however, drawn attention to them, I must again reply, and will do so as briefly as possible.

We do not suffer from ague *whenever* we are exposed to variations of temperature, because the disease is not caused by the cooling of the air, which alone is indicated by the thermometer, but by the rapid *abstraction of heat from the body*. Hence variations of temperature are of less consequence than is the *degree of exposure* to them; while more important even than either is the condition, at the time, of the *heat-generating powers of the system*. Everyone knows that great heat, when it sets in suddenly, is much more distressing than when it comes upon us by degrees, and that those who have been long inured to a hot climate suffer less from the high temperature than new arrivals. This is owing to a compensatory process, requiring time to produce its effect, by which the heat-producing powers, just alluded to, are depressed after continued exposure to a high temperature, and are exalted during continuous cold. In frigid and temperate regions, therefore, the development of animal heat is vigorous and active; so that, to produce ague there, cold requires to be supplemented by the powerful heat-abstracting influence of moisture; the capacity in this respect of the vapour of water being, as Professor Tyndall has shown, equal to sixteen thousand times that of perfectly dry air. For this reason the disease referred to is rarely met with in Northern Europe, except in wet and marshy places. In such localities the chilling effect of the raw, damp night-air is well known; and those who are insufficiently protected against it by clothing, shelter, or fire, do suffer from ague, in England as well as elsewhere. If we consider, therefore, the vast extension of drainage, we can scarcely be surprised that ague and dysentery are less common in the British Isles, and especially in the neighbourhood of London, than they were a century or two ago. In hot climates, owing to the cause already mentioned, the heat-producing powers of the body being depressed, or, in plain words, the susceptibility to chill being infinitely increased, malarious diseases are very prevalent and severe. Here, for the same reason, the presence of damp, although it renders the development of these disorders more certain, is no longer essential to their production. They consequently appear amongst the most arid and sterile rocks and sands, as well as in the swamp or jungle. At sea even the same diseases often occur when great heat is followed by rain and stormy weather. This predisposing effect of continued exposure to a high temperature explains why "a chill in certain parts of Italy," is, as you so truly observe, "a very different thing from a chill in this country"; and also why in the tropics it is a more serious matter even than in Italy. In the torrid zone there is no spot in which the cause of malarious fevers does not exist; no description of rock or soil which is exempt from it. Its intensity, however, varies much; and every difference in this respect is associated with, and is dependent upon, a corresponding change in the climatic influences already alluded to.

I hope the foregoing is clearly expressed; but should any point seem to require further explanation I shall be glad at any time to continue the subject in your columns. Having plainly stated my own views, I consider that I may in fairness expect from my opponents a distinct enunciation of theirs. At present the doctrine put forward by those who insist upon the existence of malaria vies with Proteus himself in the variety of forms it is capable of assuming. Thus at one time eminent authorities maintain that the poison is generated by decomposing vegetable matter; at another that it is produced by disintegrated granite; again we are assured that its origin is in the productive energy of the soil; then impure drinking-water is said to be the cause; while some assert that it arises from living germs, or the spores of plants growing in marshy places. In my work on Malaria I have separately considered, and I think clearly disproved, each of these views. I have shown that the diseases supposed to be caused by this "poison" of indefinite origin occur in the absence of vegetation, living or dead; where the soil is utterly sterile, and the ground undisturbed; where the drinking-water is not in fault; and where marshy plants cannot exist. Further, I have demonstrated that the disorders referred to do not prevail in the presence of any of the conditions hitherto supposed to produce them, unless these are associated with some influence capable of abstracting heat from the body.

In connexion with what I have said as to the Protean nature of the views put forward by the upholders of malaria, I may observe that, in the letter in vindication of its existence to which you refer, not a word is said of vegetable decomposition—a belief in which was very recently the orthodox faith. Can it be that the advocates of a specific poison have at present no definite theory even as to its nature and source?

In conclusion, I may repeat a question which I have asked elsewhere, but which remains unanswered—How can a marsh poison, decomposing vegetation, the productive energy of the soil, or the spores of marshy plants, be the cause of diseases which prevail in arid sandy wastes, and upon the most barren rocks, where vegetation and moisture are alike conspicuous by their absence?

I am, Sir, your obedient servant,

CHAS. F. OLDHAM,
Dhurmsala, Punjab, Jan. 27th, 1874. Surgeon-Major, Indian Army.

F. A. S.—In our opinion, a wound inflicted in the manner described must have been dangerous to life; in fact, it was no fault of the inflicter that it did not prove fatal at once. The remote dangers of a scalp wound also are not to be disregarded.

USE OF THE HEALTH REGISTER.

To the Editor of THE LANCET.

SIR,—As the subject of inquests in cases of sudden or uncertified death is now attracting notice in the public and medical world, I venture to suggest that the use of the "register of health" would afford evidence of a standing disease or condition which would explain the suddenness of an event, and save the annoyance of a judicial inquiry. Under ordinary circumstances the cause is merely a speculation, and the vague representations made to the coroner by irresponsible neighbours might be met by the production of a genuine document, which would suffice to account for death without an inquest. In instances of sudden death, where no suspicion exists, I have always been in the habit of proposing a post-mortem examination as the basis of a certificate; but even in these cases a knowledge of the antecedent disease would greatly assist. Experience is continually showing the necessity of the coroner being a medical man.

In reference to the "register," you kindly gave me an opportunity in a former communication of offering a copy of the form I advocate to any medical man requesting it. In reply I received applications from all quarters, evincing a widespread interest in the question. From the experience I have derived I have come to the conclusion, however, that the "register" should be supplied to each patient by the medical man in attendance; and, with a view to this object, Messrs. Letts and Co. now publish it on untearable fabric at a nominal cost in packets of a dozen or more. This will, in all probability, render the plan general, with a more definite result.

This arrangement does not interfere with the registration of disease referred to in former numbers of your journal, but would greatly promote it.

I am, Sir, yours truly,

Lewisham Hill, March 23rd, 1874. FREDERICK H. SMITH, M.D.

Mackeon, (Norwich.)—In Monday's debate on the Army Estimates, Mr. Holms said that if we acted on the common-sense principle adopted by the Prussians—viz., of not keeping any young men in the army after twenty-two or twenty-three years of age—we should get rid of all that immorality we now so much encouraged. In 1807 high medical evidence was given to the effect that out of a Prussian camp of 20,000, only four were withdrawn on account of the disease we fostered by keeping our soldiers in an enforced state of celibacy. But no parallel can be drawn between a continental power like Prussia and a colonial empire like England.

Lambda, (Devonport.)—Linacre, we presume, is the physician referred to. He was the author of Latin translations of a treatise of Paulus Ægineta and of several works of Galen, of which Erasmus is said to have pronounced the Latin more elegant than the original Greek. Linacre eventually entered the Church, and held several preferments.

G. N. W.—We are unable to answer the question of our correspondent in the absence of further information.

"OBSTERIC" versus "OBSTETRICAL."

To the Editor of THE LANCET.

SIR,—My attention has been accidentally drawn to what I conceive to be a misuse of the Queen's English, which has for a long time gained a firm footing in one department of medical nomenclature, and which, on the principle that "it is never too late to mend," I desire to bring under the notice of those whom it may concern. I allude to the word "obstetrical," which is not to be found in Mayne's Lexicon, nor in any Dictionary to which I have been able to refer. The adjective "obstetric," already existing as an English word, expresses the full meaning, is shorter, and to my ear more euphonious, and ought, I think, to be adopted instead of its spurious substitute. So far as I have been able to trace it, the founders of the Obstetrical Society of London were the innovators. We had long heard of obstetric medicine, obstetric works, and so on; but now we have an Obstetrical Society, Obstetrical Journal, Obstetrical Transactions, &c. &c. Such etymological inconsistencies are not creditable to a scientific body.

I remain, Sir, yours, &c.,

March, 1874. CRITIQUE.

*** "Obstetrical" is warranted by philological analogy. We prefer it, indeed, as an adjectival form to "obstetric." Would "Critique" wish to substitute "medico-psychologic" for "medico-psychological," "politic" for "political," "clinic" for "clinical"?—ED. L.

DISEASES OF THE SPLEEN.

A CORRESPONDENT is desirous of ascertaining whether anything has been published of late, either in India or at home, on diseases of the spleen.

ERRATUM. — At page 441, col. 2, line 8 from top, for Dr. Pavy, read "Dr. Parry."

COMMUNICATIONS, LETTERS, &c., have been received from—Dr. Murchison, London; Dr. Peacock, London; Dr. Poore, London; Dr. Rumsey, Cheltenham; Dr. Sutherland, London; Dr. Lombard, Leamington; Mr. A. Venn, London; Capt. Money, Little Stodham; Mr. Elwin, London; Dr. Blanc, Paris; Mr. Kershaw, London; Dr. Joyce, Cranbrook; Dr. Hardwicke, London; Mr. Rugg, Alston; Mr. Jas. Weaver; Dr. Davidson, Liverpool; Mr. R. Johnson, Gamston; Dr. Andrews, London; Mr. Butlin, London; Dr. Roth, Dresden; Dr. Brittern, Clifton; Mr. Whittington, Tuxford; Mr. Hopkins, Rugeley; Mr. Fawcett, Dolgelly; Mr. Harries, Plymouth; Dr. Sherren, Gravesend; Mr. Barnett, Weston-super-Mare; Mrs. Toyne, Manchester; Mr. Mackenzie, Kilchrenan; Mr. Dawson, Stratford-on-Avon; Dr. Roden, Droitwich; Mr. Hey, Wolverhampton; Mr. Davies, Neath; Mr. Gaffney, Marske-by-the-Sea; Mr. Smith, Lofthouse; Mr. M'Farlane, Glasgow; Mr. Davies, Llandrindod; Mr. Young, Reading; Mr. Shearer, Aberdeen; Mr. Baker, Wendover; Mr. Highton, Brigg; Mr. Geraty, Nottingham; Mr. Weir, Butcroft; Dr. Currie, Amble; Mr. Walker, Crick; Mr. Thurston, Ashford; Mr. O'Kelly, Holbeach; Mr. Hennessy, Leeds; Dr. Stallard, London; Mr. Moore, Wednesbury; Mr. Robinson, Dublin; Mr. Vine, London; Dr. Williams, Hayward's Heath; Dr. Bell Taylor, Nottingham; Mr. Pridgin Teale, Leeds; Miss E. Wood, Twickenham; Mr. Davies, Wragby; Mr. Glover, Dorrington; Mr. Horgan, Rotherham; Dr. Hutchinson, Bishop Auckland; Mr. Swinson, Chipping Campden; Mr. Ryott, Newbury; Mr. Harvey, Spalding; Mr. Robinson, Devizes; Dr. Gill, Dover; Mr. R. Freeman, London; Mr. Pyecroft, Greenwich; Mr. Robinson, Leeds; Mr. Le Page, Brandon; Mr. Atkinson, Newcastle; Mr. Roberts; Mr. Donnegan, Sligo; Mr. Leggatt, Eastry; Mr. Marshall, Limerick; Mr. Cole, Croydon; Mr. Lamplough, Bridlington; Mr. Hartley, Cheltenham; Mr. Perceval, Aspall; Mr. Thin, Edinburgh; Mr. Stewart, Edinburgh; Mr. Mackay, Crook; Mr. F. G. Brown, London; Mr. Bonney, Bolton; Mr. Dipson, Colne; Mr. Whitford, London; Mr. Shore, Marlow; Mr. Scott, Ben Rhydding; Mr. Smith, Nottingham; Mr. Watson, Newbury; Numa Ráb, London; Mr. Thomas, Narberth; Mr. Shepard, Guildford; Mr. Wiltshire, Sheffield; Dr. Molony, Chesterton; Dr. Wallich, Herne Bay; Dr. Hollis, London; Dr. Squire, London; Mr. Alex. Duncan, Glasgow; Mr. Paulton, London; Mr. Ferguson, Cheltenham; Dr. Hawkes, Alton; Mr. Estcourt, Manchester; Bertie; M.D.; Philanthropist; X. L.; The Editor of the *Nautical Magazine*; Watchman; G. B., Leeds; A. P.; Eilithyia; Ignoramus; F. A. S.; Spes; &c. &c.

Newcastle Daily Chronicle, Colonial Standard, Exeter and Plymouth Gazette, Cork Constitution, Huddersfield Chronicle, British Architect, East London Observer, Manchester Guardian, Surrey Advertiser, Lincolnshire Chronicle, Isle of Man Times, Western Morning News, Animal World, Yorkshire Post, and *Western Daily Mercury* have been received.

Medical Diary of the Week.

Monday, April 6.

ROYAL LONDON OPHTHALMIC HOSPITAL, MOORFIELDS.—Operations, 10½ A.M.
ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—Operations, 1½ P.M.
GUY'S HOSPITAL.—Operations on the Eye, 1½ P.M.
ST. MARK'S HOSPITAL.—Operations, 9 A.M. and 2 P.M.
METROPOLITAN FREE HOSPITAL.—Operations, 2 P.M.
MEDICAL SOCIETY OF LONDON.—No Meeting.

Tuesday, April 7.

ROYAL LONDON OPHTHALMIC HOSPITAL, MOORFIELDS.—Operations, 10½ A.M.
ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—Operations, 1½ P.M.
GUY'S HOSPITAL.—Operations, 1½ P.M.
WESTMINSTER HOSPITAL.—Operations, 2 P.M.
NATIONAL ORTHOPÆDIC HOSPITAL.—Operations, 2 P.M.
WEST LONDON HOSPITAL.—Operations, 3 P.M.
PATHOLOGICAL SOCIETY OF LONDON. — 8 P.M. Adjourned Discussion on "Cancer."

Wednesday, April 8.

ROYAL LONDON OPHTHALMIC HOSPITAL, MOORFIELDS.—Operations, 10½ A.M.
MIDDLESEX HOSPITAL.—Operations, 1 P.M.
ST. MARY'S HOSPITAL.—Operations, 1½ P.M.
ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—Operations, 1½ P.M.
ST. BARTHOLOMEW'S HOSPITAL.—Operations, 1½ P.M.
ST. THOMAS'S HOSPITAL.—Operations, 1½ P.M.
KING'S COLLEGE HOSPITAL.—Operations, 2 P.M.
GREAT NORTHERN HOSPITAL.—Operations, 2 P.M.
UNIVERSITY COLLEGE HOSPITAL.—Operations, 2 P.M.
LONDON HOSPITAL.—Operations, 2 P.M.
SAMARITAN FREE HOSPITAL FOR WOMEN AND CHILDREN.—Operations, 2½ P.M.
CANCER HOSPITAL.—Operations, 3 P.M.
EPIDEMIOLOGICAL SOCIETY.—8 P.M. Prof. Corfield, "On the alleged Spontaneous Production of the Poison of Enteric Fever."

Thursday, April 9.

ROYAL LONDON OPHTHALMIC HOSPITAL, MOORFIELDS.—Operations, 10½ A.M.
ST. GEORGE'S HOSPITAL.—Operations 1 P.M.
ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—Operations, 1½ P.M.
UNIVERSITY COLLEGE HOSPITAL.—Operations, 2 P.M.
ROYAL ORTHOPÆDIC HOSPITAL.—Operations, 2 P.M.
CENTRAL LONDON OPHTHALMIC HOSPITAL.—Operations, 2 P.M.
HUNTERIAN SOCIETY.—7½ P.M. Council Meeting.—8 P.M. Mr. Durham, "On a Case of Pneumothorax, resulting from Injury, treated by Paracentesis and Aspiration." — Mr. Rivington, "On a Case of Intracrbital Aneurism and some other Cases of Injury to the Head."

Friday, April 10.

ROYAL LONDON OPHTHALMIC HOSPITAL, MOORFIELDS.—Operations, 10½ A.M.
ST. GEORGE'S HOSPITAL.—Ophthalmic Operations, 1½ P.M.
ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—Operations, 1½ P.M.
GUY'S HOSPITAL.—Operations, 1½ P.M.
ROYAL SOUTH LONDON OPHTHALMIC HOSPITAL.—Operations, 2 P.M.
CENTRAL LONDON OPHTHALMIC HOSPITAL.—Operations, 2 P.M.
CLINICAL SOCIETY OF LONDON. — 8½ P.M. Mr. Callender, "On a Case of Neuralgia in Stump treated by Nerve Stretching" (the Patient will be exhibited).—Mr. Haward, "On a Case of Recurrent Sarcoma of Breast." Mr. Teevan: "Notes of Cases of Sterility after Lithotomy."

Saturday, April 11.

HOSPITAL FOR WOMEN Soho-square.—Operations, 9½ A.M.
ROYAL LONDON OPHTHALMIC HOSPITAL, MOORFIELDS.—Operations, 10½ A.M.
ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—Operations, 1½ P.M.
ST. BARTHOLOMEW'S HOSPITAL.—Operations, 1½ P.M.
KING'S COLLEGE HOSPITAL.—Operations, 1½ P.M.
ROYAL FREE HOSPITAL.—Operations, 9 A.M. and 2 P.M.
CHARING-CROSS HOSPITAL.—Operations, 2 P.M.

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